FOURTH EDITION

OFFICE MACHINES COURSE

ADDING AND CALCULATING MACHINES

PART 2

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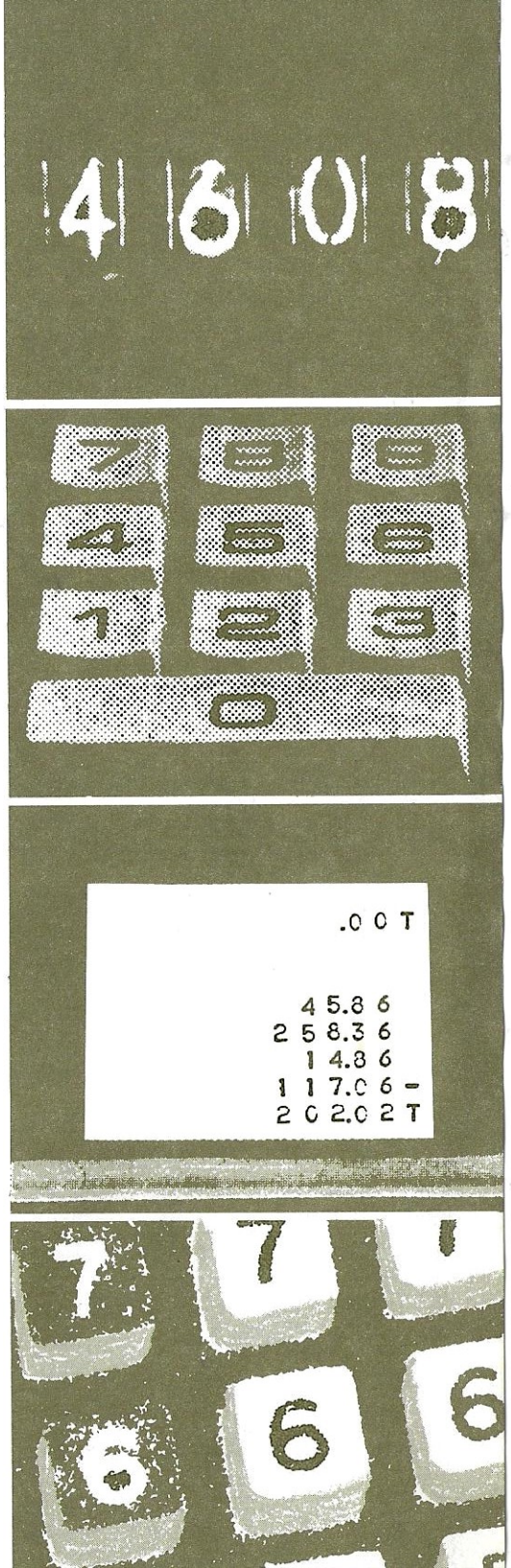

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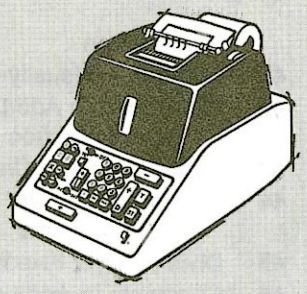
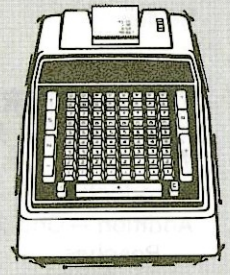
OFFICE MACHINES COURSE

TEN-KEY ADDING LISTING

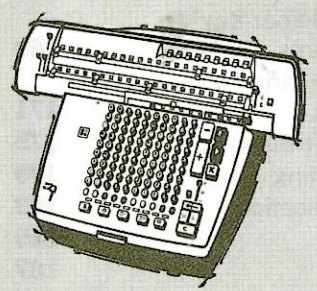


PRINTING CALCULATOR

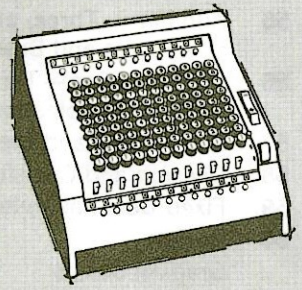
ELECTRONIC CALCULATOR



FULL-KEYBOARD ADDING LISTING



ROTARY CALCULATOR



KEY-DRIVEN CALCULATOR

FOREWORD

Teachers of office machines courses need a set of job sheets that contain typical business problems and the operational procedures to be followed to solve them with adding and calculating machines. This book contains sixty jobs that meet this need.

The job sheets are divided into six groups — one for each type of adding and calculating machine used in business offices today. Self-instructing directions are given for the operation of:

Ten-Key Adding and Listing Machines
Ten-Key Printing Calculators
Ten-Key Electronic Calculators
Full-Keyboard Adding and Listing Machines
Rotary Calculators
Key-Driven Calculators

The six sections are independent of each other. The proficiency developed in one section is not a prerequisite for the study of the remaining five. Each section contains the same number of jobs — ten. Students may be rotated from one battery of machines to another in any sequence that the instructor may indicate.

Each job is planned so that the average student can complete it in a class period. If the time allotted to machine practice makes it impossible for a student to complete every job, it is better to have students do some problems in every job than to omit selected jobs entirely. When time must be saved, the most satisfactory procedure to follow is to have students do every other problem of every job.

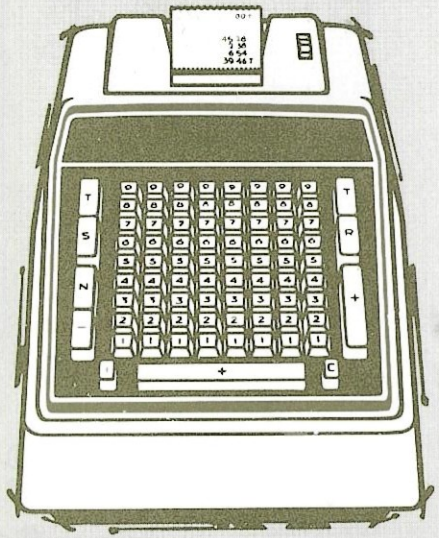
In planning and preparing the instructional material, certain basic qualities have been maintained:

1. The book is planned so that it is as self-instructional as possible. All instructions for new work are presented in an easy to follow, step-by-step plan.
2. The teaching materials are carefully planned, easy to follow, convenient for practice, and simple to check.
3. The jobs are arranged in carefully planned sequences, going from the simple to the somewhat more complex operations.
4. The instructional materials are well within the range of the ability of the student who may use this book.
5. The format of the book is designed so that it may be used easily at the machine. Students may remove the parts of the pages that contain problems and leave in the book for future reference the parts that contain instructional material.
6. Each timed drill contains problems which test the student's mastery of the new procedures presented in the job as well as provides the basis for the development of a reasonable speed. To encourage a student to strive for better achievement, self-grading scales are provided for every timed drill. A bonus is awarded for achievement that surpasses the norms listed on the grading scales.
7. With the use of this instructional material, the student attains a reasonable degree of efficiency in the basic operation of the six types of adding and calculating machines, and does so in a reasonable length of time.
8. The last job sheet of each of the six sections of this book contains a comprehensive review. These job sheets, job numbers 10, 20, 30, 40, 50, and 60, may be used as timed tests or as review, at the option of the teacher.
9. To help the teacher evaluate a student's achievement, twelve tests, two on each of the six sections, and a final examination are enclosed in each book. The final examination is divided into six parts — one for each section. The tests measure a student's performance at the machines; the final examination, his comprehension of the theory. Any test or section of the examination may be omitted without affecting the validity of the remaining tests or sections. Practical grading scales are provided for the evaluation of all jobs, tests, and final examination.
10. The materials in this course may be used on any of the various adding and calculating machines that are on the market. Special instructions are included to cover the more common differences that exist among those makes of machines and the various models thereof.

The authors would like to take this opportunity to express appreciation to the various machine manufacturers and their representatives who have been so cooperative.

N.J.C.
W.R.P.
P.L.A.

OFFICE MACHINES COURSE



VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

HIGHLIGHTS

Adding machines that are classified as full-keyboard adding listing machines include the **R. C. Allen, Burroughs, Monroe, National, Remington, Smith-Corona,** and **Victor.** These machines are used primarily to add columns of figures, printing them on tapes that can be filed away for future reference or auditing. Some firms also use the full-keyboard adding listing machines for subtraction and multiplication of numbers. Full-keyboard adding listing machines are used widely in financial institutions.

Full-keyboard adding listing machines can be readily identified by:

1. Keyboards with from 7 to 10 rows or **banks** of keys, each of which begins with 1 at the end of the machine nearest the operator and ascends to 9 at the opposite end.
2. A narrow roll of paper, called **tape,** on which are printed the numbers that are added.
3. Total keys, subtotal keys, non-add keys, repeat keys, subtraction keys or bars, add bars, and correction keys.

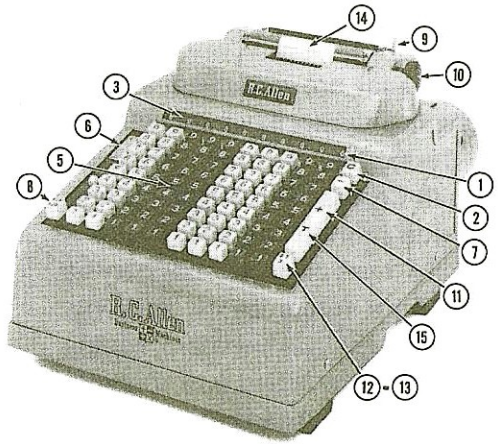
The arrangement of the keys on full-keyboard adding listing machines makes possible the use of the multiple-key depression technique which enables an operator to depress the keys for a number and add-list it in one or two motions. To do this, an operator uses his thumb, first, and second fingers to depress the keys for a number, and his fourth finger to add-list it. A fully trained operator depresses two to five keys in a single motion. Proficiency in the use of the multiple-depression technique enables an operator to develop an adding speed of from 80 to 100 depressions per minute. The main objective of this course is to develop speed and accuracy in the use of the multiple-key depression technique as it applies to adding, subtracting, and multiplying on a full-keyboard adding listing machine.

Since full-keyboard adding listing machines are generally slower mechanically than other adding and calculating machines, the student should attempt to become as efficient as possible in fingering techniques.

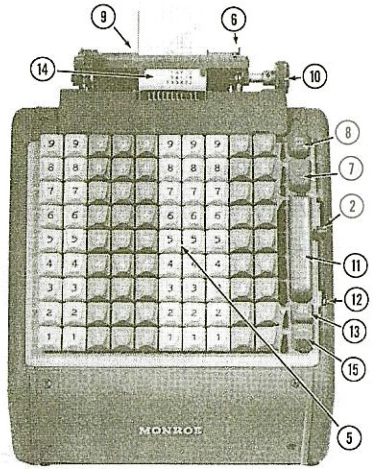
VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

PART NO. **MACHINE PARTS**

1 Answer Dials
2 Clear Key
3 Decimal Indicator
4 Extra Capacity Key
5 Keyboard
6 Line Space Selector
7 Minus Bar
8 Non-Add Key
9 Paper Release Lever
10 Platen Knob
11 Plus Bar
12 Repeat Key
13 Subtotal Key
14 Tape
15 Total Bar



R. C. Allen



Monroe

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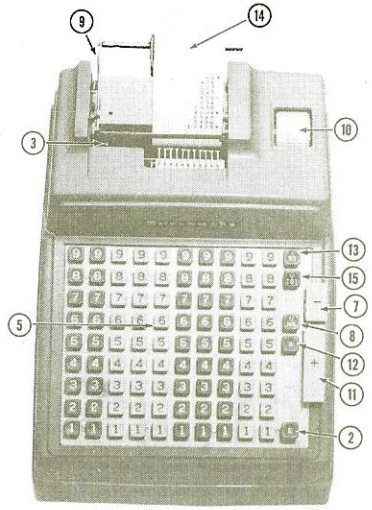
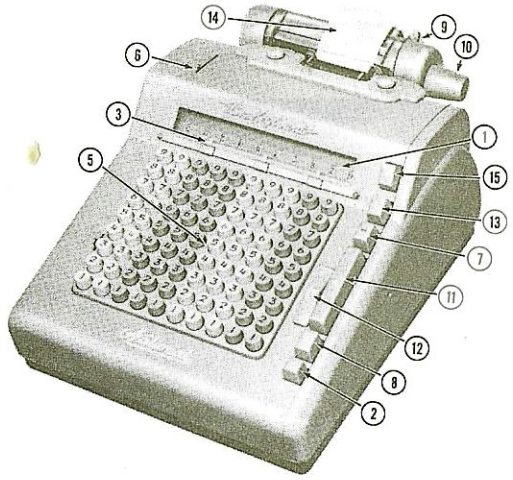
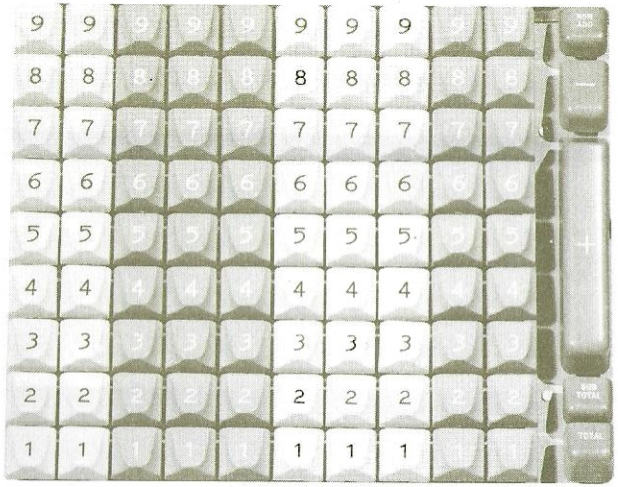


Burroughs

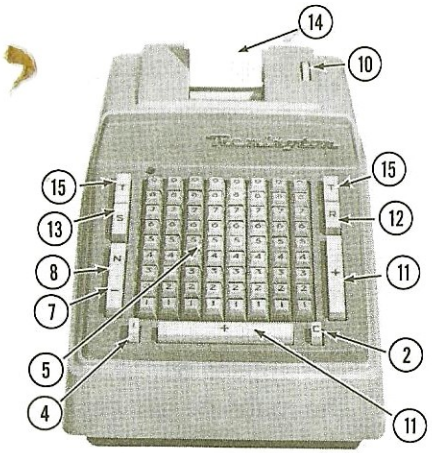


National Cash Register

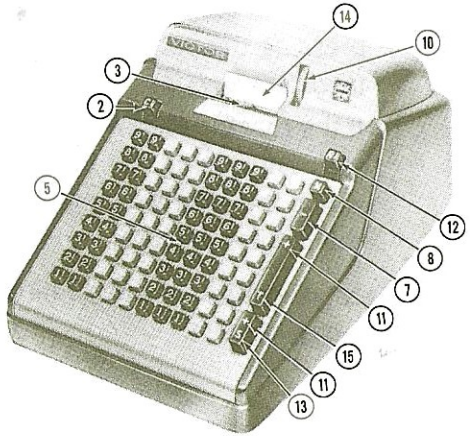


Keyboard Arrangement

Multiple-key Depression Technique



Remington



Victor

PART NO.	MACHINE PARTS
1	Answer Dials
2	Clear Key
3	Decimal Indicator
4	Extra Capacity Key
5	Keyboard
6	Line Space Selector
7	Minus Bar
8	Non-Add Key
9	Paper Release Lever
10	Platen Knob
11	Plus Bar
12	Repeat Key
13	Subtotal Key
14	Tape
15	Total Bar

9 3

VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

GENERAL INSTRUCTIONS

Proficiency in the use of any office machine is dependent upon the formation of acceptable habits of operation. To insure maximum efficiency in the operation of a full-keyboard adding listing machine, one should cultivate the following habits:

1. Maintain a neat work area.
   a. Clear your desk or table of books and papers that do not pertain to the course.
   b. Place the machine on the right of your desk or table and this book to the left of the machine.
   c. Position the machine and book to give you ease of operation and reading. Study the arrangement of materials in the picture at the right.
   d. Sit erect, relax, with feet flat on the floor.
2. Clear the machine before starting a job.
   a. Depress the total key. The total key is located at the right side of the keyboard. It may be identified with a "*," "T," "TOT," or "TOTAL" printed on it. On some machines, you may also have to depress the plus (+) or motor bar.
   b. Begin and end every problem by taking a total. This clears out any numbers that may have been left in the machine from previous use. An asterisk (*), (T), or (◁) will appear on the tape to indicate that the machine has been cleared.
3. Correct errors. If incorrect keys are depressed and the error is discovered before the number has been printed, the error can be corrected by:
   a. Depressing the correction key. The correction key is marked "E," "C," or "Error."
   b. If the correct key is in the same row, depressing the correct key will release the incorrect key.
   c. If the machine has an error key for each row, depressing the key for the row in which the error was made will eliminate the incorrect figure.
4. Read all instructions pertaining to a job before beginning it.

Correct Position at Machine

31 ADDITION

VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

JOB NO. 31
ADDITION

Name _____ No. of Errors _____
Period _____ Date _____ Rating _____

AIM:

To introduce the multiple-key depression technique.

PROCEDURE

1. ADD-LIST TWO–DIGIT NUMBERS

in Problems 1-10. The items in Problem 1 contain two-digit numbers that are close together on the keyboard. To add-list the first number, 44:

a. Use the first finger to depress 4 in row two from the right of the keyboard.
b. Use the second finger to depress 4 in row one.
c. With the fourth finger, depress the plus (+) bar.
d. Whenever convenient, depress the keys for the number and the plus (+) bar together in one hand motion. On the **National Live Keyboard,** pushing the keys all the way down add-lists the items without the use of a motor bar.
e. Work down the column until you have added all the numbers.
f. After you have add-listed all the items, take a total (see page 94).
g. Write the answer, 8.14, in the space provided below the problem. Immediately do the problem a second time. Try to improve your speed.
h. If the second answer is different from the first, write it directly below the first answer, and do the problem again. Write the answer that proves correct in the column at the right.
i. Tear off the tape for each problem, and write the number of the problem on it.

2. ADD-LIST THREE-DIGIT NUMBERS

that contain the same figures (like 4.44) by using the first, second, and third fingers to depress the three numbers with one hand motion.

3. ADD-LIST THREE-DIGIT NUMBERS

in which **only the first two figures are the same,** following these steps:

a. Use the thumb to depress the two keys for the figures that are the same. The rows of keys are close enough to each other to permit you to depress two adjacent keys by centering your thumb between the rows.

1	2	3	4	5
.44	4.44	.56	7.77	.45
.66	5.55	.78	7.78	.66
.22	3.33	.32	8.88	.67
.55	8.88	.22	2.22	.33
.33	6.66	.23	2.23	.34
.11	7.77	.55	5.55	.78
.77	2.22	.56	5.56	.11
.99	9.99	.88	8.88	.13
.88	1.11	.89	8.89	.77
.11	8.88	.11	1.11	.79
.66	5.55	.12	1.12	.22
.99	2.22	.44	4.44	.24
.55	6.66	.45	5.55	.33
.88	3.33	.66	5.56	.34

6	7	8	9	10
.66	6.66	.33	3.33	.99
.68	6.68	.66	6.66	.56
.33	3.33	.22	2.22	.68
.35	3.35	.77	7.77	.45
.55	5.55	.11	1.11	.79
.57	5.57	.88	8.88	.34
.44	4.44	.33	3.33	.66
.46	4.46	.99	9.99	.23
.99	9.99	.11	1.11	.57
.68	6.66	.88	8.88	.13
.13	6.68	.22	2.22	.44
.77	1.11	.77	7.77	.89
.22	4.44	.33	3.33	.55
.68	2.35	.66	6.66	.78

95

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____

JOB NO. 31 / CONTINUED

11	12	13	14	15
.11	.88	.44	.66	.22
.44	.89	.45	.68	.99
.22	.33	.11	.44	.58
.55	.34	.12	.46	.33
.33	.66	.55	.11	.35
.88	.67	.56	.13	.88
.66	.44	.22	.33	.46
.99	.45	.23	.35	.22
.77	.11	.66	.77	.24
.12	.12	.67	.79	.66
.67	.55	.33	.22	.13
.89	.22	.34	.24	.66
.56	.23	.77	.25	.24
.78	.56	.78	.57	.77

16	17	18	19	20
9.99	3.33	7.77	2.22	4.44
2.22	3.34	7.78	2.24	4.46
7.77	6.66	1.11	6.66	2.22
8.88	6.67	1.12	6.68	2.24
6.66	4.44	6.66	1.11	1.11
3.33	4.45	6.67	1.13	1.13
5.55	1.11	3.33	7.77	3.33
4.44	1.12	3.34	7.79	3.35
8.88	8.88	5.55	4.44	5.55
7.77	8.89	5.56	4.46	5.57
2.22	5.55	2.22	3.33	2.22
5.55	5.56	2.23	3.35	2.24
1.11	2.22	4.44	5.55	3.33
9.99	2.23	4.45	5.57	3.35

59 96

ANSWERS

11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____

31 ADDITION

b. Use the first or second finger to depress the remaining figure in row one.
c. Use the fourth finger to depress the plus (+) bar. All three depressions should be made simultaneously when it is convenient.
d. On the **Remington** machine, numbers can be add-listed by depressing either the side plus (+) bar or the bottom bar.
e. On the **National Live Keyboard** machine, depressing the keys for the number also add-lists it because each key, if depressed all the way, automatically operates the add-list mechanism.

4. ADD-LIST ITEMS in Problems 11-20 using the procedures described above.

a. Read the numbers at a glance. Avoid the need for a second look.
b. In reading numbers and depressing keys, turn the eyes, not the head.

5. COMPLETE REMAINING PROBLEMS. When all problems have been solved, prepare job for instructor.

a. Write your name and other information called for in the spaces provided at the top of the job sheet.
b. Tear off the job sheet at the perforation.
c. Arrange the tapes in numerical order.
d. With a staple or clip, attach the tapes to the upper left side of the job sheet.

6. GIVE JOB TO INSTRUCTOR when completed.

32 ADDITION — ASCENDING REACHES

JOB NO. 32
ADDITION — ASCENDING REACHES

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To present the technique used to depress keys for numbers having two or three digits which are **not** close together on the keyboard.
2. To present the use of the **non-add** key to number problems on the tape.

PROCEDURE

1. **CLEAR MACHINE.** An asterisk (*), (<), or (T) must appear at the beginning and end of the tape for each problem.
2. **NUMBER EACH PROBLEM.** To do this, depress the key or keys for the problem number, depress the non-add key, and operate the plus (+) bar, if necessary. Space once after the problem number by depressing the plus (+) bar.
3. **ADD-LIST ITEMS** in each problem using the following multiple-key depression technique:
   a. In Problem 1, enter 11 in the machine in one motion, using the first and second fingers to depress two 1's and the fourth finger to operate the plus (+) bar simultaneously.
   b. To enter 14 in the machine, use one motion, depressing the 1 with the thumb and the 4 with the second finger while the fourth finger operates the plus (+) bar simultaneously.
   c. In Problem 6, enter 6.69 in the machine in one motion, using the tip or side of the thumb to depress the two 6's and the second finger to depress the 9. The fourth finger is kept on the plus (+) bar, which is depressed at the same time whenever it is convenient to do so.
   d. In completing Problems 1-10, use all three fingering techniques. Avoid awkward positions by depressing the plus (+) bar separately whenever necessary.

1	2	3	4	5
.11	.99	.11	.99	.11
.14	.69	.15	.49	.17
.22	.88	.22	.88	.22
.25	.58	.26	.38	.28
.33	.77	.33	.77	.33
.36	.47	.37	.27	.39
.36	.47	.37	.27	.39
.44	.66	.44	.66	.44
.47	.36	.48	.16	.49
.55	.55	.55	.55	.55
.58	.25	.59	.15	.59
.66	.44	.66	.44	.66
.69	.14	.69	.14	.69
.77	.33	.11	.66	.11
.79	.13	.15	.16	.17

6	7	8	9	10
6.66	9.99	1.12	3.38	3.36
6.69	1.19	2.24	4.49	5.58
7.77	8.88	3.36	1.15	4.48
7.79	2.28	4.48	2.26	5.59
8.88	7.77	5.59	3.39	1.16
8.89	3.37	1.13	1.16	2.28
9.99	6.66	2.25	2.27	3.39
2.29	4.46	3.37	3.39	2.27
8.88	5.55	4.49	1.17	4.48
1.18	5.59	5.58	2.28	3.37
5.55	4.44	1.14	1.18	6.69
5.59	4.48	2.26	1.19	2.25
4.44	6.66	6.68	5.59	7.79
4.48	6.69	3.37	3.38	1.18

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

JOB NO. 32 / CONTINUED

11	12	13	14
.33	1.11	.66	7.77
.34	1.12	.67	8.78
.66	4.44	.44	3.38
.68	4.46	.46	3.35
.11	9.99	.22	8.88
.14	6.69	.25	4.48
.55	3.33	.33	1.11
.59	3.37	.37	1.16
.88	1.11	.77	2.22
.38	1.16	.27	2.29
.33	2.22	.22	1.11
.39	2.28	.28	1.19
.77	5.55	.55	6.66
.48	7.79	.89	7.79
.66	4.44	.66	5.55

ANSWERS

11 _____

12 _____

13 _____

14 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6	7
.23	3.34	1.12	2.23	3.37	.12	2.23
5.56	.67	5.59	4.48	7.78	4.45	.56
.35	1.14	1.19	5.57	5.58	.78	8.89
2.24	6.68	3.39	2.25	1.16	3.35	.46
.57	.25	6.68	4.49	4.45	.57	6.68
7.79	1.17	1.18	3.34	7.79	7.79	.25
.36	.29	4.47	1.15	3.36	.36	5.58
4.47	3.38	2.26	2.28	2.27	6.69	.26
1.16	8.89	1.17	4.46	5.56	.37	5.59
4.49	4.46	3.35	6.69	2.24	1.16	.17
3.39	6.67	2.29	3.38	6.67	4.49	1.19
1.17	.48	1.14	8.89	1.13	3.39	2.28
6.69	7.79	1.19	4.49	4.45	5.57	6.68
.68	.18	3.39	3.34	7.79	7.79	2.25
5.57	5.57	5.58	1.15	3.35	5.58	5.58
44.72	50.96	43.99	58.19	66.95	52.46	48.65

98

32 ADDITION — ASCENDING REACHES

4. COMPLETE THE TIMED DRILL.

a. Add the problems only once.

b. Place a check mark (✓) to the right of the answer if your tape shows the same sum; an "X" if your sum is different.

c. In the spaces provided, record the starting and finishing time. Drop fractions of a minute smaller than ½. Fractions larger than ½ minute but less than one full minute are recorded as ½ minute. Subtract to get the time required for completion of the drill.

d. Count the "X's", and use Grading Scale No. 2 on page 187 to determine your grade.

e. If you have time, do the Timed Drill again. Try to better your time.

f. Always record your best grade on the Achievement Chart on page 188.

5. FILL IN INFORMATION required on the spaces provided on page 97.

6. ATTACH TAPES to the job sheet, and give the completed job to your instructor.

33 ADDITION — DESCENDING REACHES

VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

JOB NO. 33
ADDITION — DESCENDING REACHES

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To introduce the technique used to depress keys for numbers having descending reaches of 1 to 8 steps.

PROCEDURE

1. **CLEAR MACHINE.**
2. **NUMBER EACH PROBLEM.**
3. **ADD-LIST ITEMS** in each problem using the following multiple-key depression technique:
   a. To add-list a two-digit number such as 21 or 91:
      (1) Use the first or second finger to depress the higher figure, 2 or 9, in row two.
      (2) Use the thumb to depress the low figure, 1, in row one.
      (3) Use the tip or side of the fourth finger to operate the plus (+) bar.
      (4) Depress with all three fingers simultaneously whenever convenient.
   b. To add-list a three-digit number such as 2.21 or 9.91:
      (1) Center the first or second finger over the two adjacent figures of the number in rows three and two to depress 22 or 99.
      (2) Use the thumb to depress the low figure of the number, 1, in row one.
      (3) Use the tip or side of the fourth finger to depress the plus (+) bar.

1	2	3	4	5
.21	.31	.41	.51	.71
.32	.42	.52	.62	.82
.43	.53	.63	.73	.93
.54	.64	.74	.84	.81
.65	.75	.85	.95	.92
.76	.86	.96	.61	.91
.87	.97	.85	.72	.71
.98	.86	.74	.83	.93
.87	.75	.63	.94	.82
.76	.64	.52	.51	.81
.65	.53	.41	.95	.92
.54	.42	.96	.62	.91
.43	.31	.52	.84	.82
.32	.53	.85	.73	.93

6	7	8	9	10
2.21	3.31	4.41	5.51	7.71
3.32	4.42	5.52	6.62	8.82
4.43	5.53	6.63	7.73	9.93
5.54	6.64	7.74	8.84	8.81
6.65	7.75	8.85	9.95	9.92
7.76	8.86	9.96	6.61	9.91
8.87	9.97	8.85	7.72	7.71
9.98	8.86	7.74	8.83	9.93
8.87	7.75	6.63	9.94	8.82
7.76	6.64	5.52	5.51	8.81
6.65	5.53	4.41	9.95	9.92
5.54	4.42	9.96	6.62	9.91
4.43	3.31	5.52	8.84	8.82
3.32	5.53	8.85	7.73	9.93

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

99

JOB NO. 33 / CONTINUED

11	12	13	14
.21	9.98	.97	4.41
.98	2.21	.41	9.95
.32	8.87	.86	5.52
.87	4.42	.52	8.84
.43	7.76	.75	6.63
.76	3.31	.96	5.51
.54	6.65	.64	7.74
.65	8.86	.85	9.94
.32	5.54	.53	8.85
.98	9.97	.74	6.62
.43	4.43	.42	9.96
.87	6.64	.85	3.32
.54	3.32	.31	5.51
.76	5.53	.52	7.72
.98	2.21	.74	6.63

ANSWERS

11 _____

12 _____

13 _____

14 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6	7
1.12	8.89	7.79	1.15	.38	.19	.38
9.91	8.83	5.51	9.97	9.98	2.21	1.19
2.23	1.13	1.14	2.26	.49	.34	9.98
9.92	7.72	9.96	8.86	8.87	8.81	2.21
3.34	2.24	2.25	3.35	1.17	2.24	.49
8.81	6.61	8.85	7.75	7.76	6.61	8.87
4.45	3.35	3.36	4.48	.28	.25	4.43
9.93	9.95	7.74	6.64	6.65	8.85	.17
5.56	4.46	4.47	5.59	.39	.37	2.24
8.82	8.84	6.63	5.54	7.75	5.53	.39
6.67	5.57	5.58	1.16	1.18	1.17	5.54
7.71	7.73	5.52	4.42	4.43	7.76	8.81
7.78	6.68	6.69	2.27	.29	.34	3.32
9.94	6.62	4.41	3.31	3.32	8.81	.17
1.12	3.35	9.96	7.75	5.54	6.61	5.54
97.31	91.97	89.86	7450	58.48	60.09	53.73

-1 00

33 ADDITION — DESCENDING REACHES

(4) Depress all three fingers simultaneously whenever convenient.

4. COMPLETE PROBLEMS 1-14.

a. Add-list each problem twice, and record the correct answer in the column at the right of the page.

b. Attach the tapes to the left side of the job sheet.

5. COMPLETE THE TIMED DRILL. Follow the procedure you used in Job No. 32.

6. FILL IN INFORMATION required in the spaces provided on page 99.

7. GIVE JOB TO INSTRUCTOR when completed.

34 ADDITION — LONG REACHES AND ZEROS

JOB NO. 34
ADDITION — LONG REACHES AND ZEROS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To present the use of the thumb for depressing the low figure of three-digit numbers.
2. To present the procedure followed for add-listing numbers containing zeros.

PROCEDURE

1. **CLEAR MACHINE,** and number each problem.
2. **ADD-LIST ITEMS** in each problem by using the following multiple-key depression technique:
   a. A three-digit number with a low figure at the left such as 1.23:
      (1) Use the thumb to depress 1 in row three.
      (2) Use the first and second fingers to depress 2 and 3 in rows two and one.
   b. A three-digit number with a low figure at the right such as 7.86:
      (1) Turn the wrist slightly to the left to bring the thumb in position to depress 6 in row one.
      (2) Use the first and second fingers to depress 7 and 8 in rows three and two.
   c. A three-digit number with a low figure in the middle such as 2.13:
      (1) Turn the wrist slightly to the left to bring the thumb in position to depress 1 in row two.

1	2	3	4	5
1.23	3.57	4.58	7.86	8.97
7.89	4.69	2.34	5.63	2.31
2.34	6.79	5.67	3.72	6.94
5.67	1.34	7.89	5.73	3.42
2.36	4.69	6.89	7.96	5.64
4.69	2.45	1.45	2.51	4.72
7.89	4.58	4.79	6.74	7.86
3.46	2.47	2.56	3.62	2.41
6.89	7.89	4.68	7.94	8.96
1.47	3.57	2.58	4.61	3.71
5.67	2.46	1.47	6.83	7.84
3.47	5.89	5.78	5.72	4.73
5.68	1.36	6.89	8.97	8.95
1.25	4.78	3.68	2.31	3.61

6	7	8	9	10
2.13	4.25	8.29	1.03	6.10
8.79	6.57	6.27	4.09	8.40
4.37	2.13	5.49	2.08	4.30
7.68	8.78	6.58	6.07	6.20
4.27	3.24	2.14	4.06	9.50
7.58	8.59	8.69	7.08	5.30
5.19	4.28	3.25	3.09	3.10
8.19	7.57	8.59	5.08	8.20
5.27	3.14	5.25	1.30	2.01
6.37	6.47	7.49	3.80	5.03
3.27	5.28	3.15	5.70	7.02
6.56	7.29	7.19	2.50	9.05
2.16	4.38	5.29	1.80	6.01
7.69	6.18	8.27	3.50	4.02

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

101

(101)

JOB NO. 34 / CONTINUED

11	12	13	14
1.23	8.97	2.12	1.20
7.89	2.31	8.79	8.20
3.47	6.73	4.25	5.70
5.78	4.53	6.57	3.80
1.25	2.61	5.16	1.90
4.78	5.83	7.48	7.60
7.89	3.52	3.14	3.20
3.47	7.83	6.47	6.90
1.45	2.31	2.14	4.60
6.78	6.95	8.69	3.60
2.47	3.42	3.27	9.10
4.58	5.61	6.56	2.80
7.89	2.31	4.35	6.50
3.46	8.94	7.48	7.90
4.58	5.61	3.27	9.10

ANSWERS

11 _____

12 _____

13 _____

14 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6	7
1.12	3.34	1.23	3.42	3.24	6.84	3.47
.38	.45	7.89	6.85	8.69	3.52	5.78
9.98	.12	3.57	5.64	5.68	8.95	1.46
.19	7.30	4.69	8.97	1.25	5.61	4.56
8.97	2.05	4.58	6.94	4.78	2.51	7.89
2.31	3.52	2.34	2.42	6.79	6.84	2.36
5.78	7.83	3.47	2.12	1.47	8.97	6.78
.07	1.25	5.78	8.79	5.78	3.72	1.24
1.45	4.78	3.57	4.25	7.89	4.27	4.68
.16	.05	1.25	6.57	3.58	7.58	2.35
3.04	6.69	7.89	8.29	1.46	3.24	4.57
7.50	.68	3.61	3.17	4.67	4.59	3.45
5.54	7.30	8.97	6.28	5.64	2.14	6.78
1.34	9.02	2.31	4.15	4.72	6.59	7.89
9.98	5.81	5.78	2.12	1.47	3.24	2.35
57.81	60.19	66.99	79.98	67.11	78.61	65.61

1 0 2

(2) Use the first and second fingers to depress 2 and 3 in rows three and one.

d. Three-digit numbers containing zeros:
   (1) Do not depress any key in the row in which the zero appears.
   (2) Use the thumb and first or second finger to depress the other two keys.

e. In all of the above fingering techniques, except on the **National Live Keyboard** machine, simultaneously depress the plus (+) bar with the fourth finger whenever convenient.

3. COMPLETE PROBLEMS 1-14.
a. Follow the procedures outlined above.
b. Add-list each problem twice, and record the correct answer in the column at the right of the page.
c. Try to increase your speed the second time you add-list each problem.

4. COMPLETE THE TIMED DRILL. Follow the procedure outlined in Job No. 32.

5. ATTACH TAPES to the left side of the job sheet, and give the completed job to your instructor.

35 SUBTRACTION AND CORRECTION OF ERRORS

VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

JOB NO. 35
SUBTRACTION AND CORRECTION OF ERRORS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To introduce the use of the minus (—) bar to subtract.
2. To present the procedure used in correcting printed errors.

PROCEDURE

1. **CLEAR MACHINE,** and number each problem.
2. **SUBTRACT** 1.56 from 6.34 — Problem 1 — following these steps:
   a. Add-list the **minuend** (top number), 6.34.
   b. Depress the keys for the **subtrahend** (bottom number), 1.56, and depress the minus (—) bar.
   c. Take a total as usual.
   d. Do the problem again, and record the verified **difference** (answer), 4.78, in the spaces provided.
3. **ADD-LIST THREE-DIGIT NUMBERS** with figure combinations that cannot be depressed simultaneously, such as 4.21, following these steps:
   a. Use the first finger to depress 4 in row three.
   b. With a separate hand motion, use the first finger to depress 2 in row two, and the thumb to depress 1 in row one.

1	2	3	4	5
6.34 —1.56	4.23 —1.87	7.59 —1.25	7.18 —5.89	7.12 —3.25
6	7	8	9	10
9.47 —3.68	7.35 —1.27	8.73 —7.02	9.16 —2.69	6.13 —5.14
11	12	13	14	15
4.21 3.98 6.32 9.75 4.85 7.31 2.62 5.86 1.54 8.64 3.48 6.21 9.56 5.23 4.21	7.35 2.68 4.19 8.14 1.63 3.93 6.15 2.49 9.15 5.41 7.21 4.23 1.38 6.12 7.35	6.13 1.28 5.31 7.87 2.37 9.46 4.71 1.32 6.87 3.18 8.56 2.74 7.51 1.26 6.13	8.67 2.48 5.92 7.53 1.29 3.43 8.23 5.34 2.72 9.17 3.82 8.52 1.73 6.41 2.52	3.59 9.71 5.14 2.78 8.54 1.51 3.21 6.54 4.12 9.42 2.18 5.87 3.21 8.12 1.57

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____

1 0 3

JOB NO. 35 / CONTINUED

16	17	18	19
9.47	6.76	2.63	4.59
4.13	2.54	8.13	7.52
7.54	5.85	6.91	1.53
3.19	9.72	1.52	5.24
5.91	3.28	9.69	8.71
1.42	7.97	3.64	3.76
6.14	4.21	5.79	6.34
2.59	1.61	2.65	2.54
5.13	8.62	8.61	5.43
9.41	3.63	4.98	9.48
3.73	5.93	1.72	1.78
7.32	2.59	7.45	4.91
4.89	9.84	3.74	2.67
1.43	4.21	9.52	6.97
6.72	1.27	2.79	1.53

ANSWERS

16 _____

17 _____

18 _____

19 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6	7
5.82	1.56	9.86	2.52	4.55	7.08	5.60
1.65	8.72	1.98	6.41	−3.06	−2.89	−2.98
4.32	1.53	4.86	4.64			
6.81	5.24	6.92	6.53	1.49	4.19	2.62
8.71	2.69	9.45	1.29	8	9	10
3.76	8.91	1.62	3.43			
6.34	2.65	5.21	6.72	9.06	8.79	7.07
2.54	1.59	1.79	1.43	−3.65	−2.76	−1.87
5.43	4.82	4.65	4.89			
9.48	−6.42	9.37	7.32	5.41	6.03	5.20
1.78	2.73	7.26	3.73	11	12	13
3.74	4.91	1.81	6.16			
5.79	2.67	9.82	3.79	6.05	9.90	6.88
7.41	6.97	7.12	5.98	−1.65	−3.76	−3.56
4.87	1.53	1.59	1.98			
78.45	62.94	83.31	66.82	4.40	6.14	3.32

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35 SUBTRACTION AND CORRECTION OF ERRORS

c. Whenever convenient, use the fourth finger to depress the plus (+) bar simultaneously.

4. **CORRECT ERRORS** that have just been printed on the tape by using this procedure:
   a. Depress the same keys that were used to add the number incorrectly.
   b. Depress the minus (—) bar.
   c. Enter the item correctly and complete the addition.

5. **CORRECT ERRORS** detected after the total key has been depressed by making penciled adjustments on the tape.
   It is faster to do the whole subtraction problem over again than to attempt machine correction of errors.

6. **COMPLETE ALL PROBLEMS** in this job. Attach the tapes to the left side of the job sheet.

7. **COMPLETE THE TIMED DRILL,** as usual. Use Grading Scale No. 3 on page 187 to determine your grade.
   a. If you have time, do the Timed Drill again. Record your best grade on the Achievement Chart on page 188.

8. **GIVE JOB TO INSTRUCTOR** when completed.

NOTE: Before proceeding to Job No. 36, ask your instructor about Test No. 7. He may want you to complete it before you start Job No. 36.

36
FOUR-DIGIT ADDITION AND MULTIPLICATION

JOB NO. 36 FOUR-DIGIT ADDITION AND MULTIPLICATION

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To develop speed and accuracy in addition of four-digit numbers.
2. To present the use of repeat (R) and multiplication (×) keys to multiply.

PROCEDURE

1. **CLEAR MACHINE,** and number the problems.
2. **ADD-LIST FOUR-DIGIT** numbers like 67.45 by following these steps:
   a. Use the first finger to depress 6 in row four, and the second finger to depress 7 in row three at the same time.
   b. Use a second hand motion to depress 4 in row two with the first finger and 5 in row one with the second finger, depressing the plus (+) bar simultaneously with the fourth finger.
   c. If the figures are more than three keys apart, use the thumb and the first or second finger, as you did in the previous jobs.
   d. On the **National Live Keyboard** machine, depress the first two digits part way. The last two digits must be depressed all the way down in order to register the number.
3. **ADD-LIST A SERIES OF NUMBERS** that are exactly the same (Problems 4-6) by following this procedure:
   a. Set up the number on the keyboard.
   b. Engage the repeat (R) key or lever, and operate the plus (+) bar, or hold down the live multiplication (×) key until the addend is added the required number of times.
   c. Depress the error (E) or correction (C) key, and repeat the procedure for the remaining series of like numbers.

1	2	3	4	5	6
67.45	67.14	14.33	1.39	9.12	6.89
89.12	45.51	25.37	1.39	9.12	6.89
33.87	78.74	26.63	1.39	9.12	6.89
68.43	12.62	49.43	1.39	1.57	6.89
12.78	46.15	59.31	8.65	1.57	2.75
54.98	65.19	27.54	8.65	1.57	2.75
32.68	98.85	38.72	8.65	3.75	2.75
57.13	34.69	36.41	8.65	3.75	5.14
89.12	57.26	59.32	8.65	3.75	5.14
76.46	87.63	15.96	4.76	3.75	5.14
24.79	99.15	27.62	4.76	6.35	9.22
98.43	13.73	29.71	4.76	6.35	9.22
44.88	46.52	48.21	4.76	6.35	9.22
13.57	98.27	19.52	4.76	6.35	9.22

.00*
.10#
4.87
4.87
4.87
4.87
4.87
4.87
4.87
4.87
4.87
48.70
48.70
48.70
48.70

233.76*

7. 58 × 6 _____
8. 46 × 4 _____
9. 55 × 9 _____
10. 487 × 48 _____
11. 168 × 25 _____
12. 276 × 56 _____
13. 398 × 36 _____
14. 413 × 7.59 _____
15. 849 × 2.75 _____
16. 138 × 8.42 _____
17. 952 × 6.41 _____
18. 823 × 3.21 _____
19. 534 × 6.15 _____
20. 876 × 2.41 _____

Tape for Problem 10 from a Burroughs Machine.

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

JOB NO. 36 / CONTINUED

21	22	23
81.21	25.45	63.12
14.13	75.13	15.13
62.72	15.67	93.82
35.91	93.54	34.36
23.78	58.16	67.52
15.86	35.81	23.45
73.94	26.36	96.12
53.18	89.12	41.90
25.92	64.18	13.85
16.87	48.43	54.15
34.32	80.67	84.45
66.53	13.85	37.62
75.20	52.37	74.25
98.90	26.55	49.83
16.87	64.18	13.85

ANSWERS

21 _____

22 _____

23 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3
74.22	45.94	45.35
95.61	15.52	78.46
62.76	79.32	24.98
52.73	15.98	11.99
41.99	19.31	46.27
83.45	67.33	76.32
91.26	14.86	79.21
74.25	77.14	35.44
61.78	29.52	65.87
93.16	23.72	35.79
72.49	49.51	21.76
81.27	44.28	87.43
73.39	13.79	55.79
51.98	32.59	35.32
61.78	29.52	76.32
1,072.12	558.33	776.30

106

4	183 × 28	5,124
5	265 × 52	13,780
6	965 × 41	39,565
7	363 × 142	51,546
8	656 × 381	249,936
9	843 × 625	526,875
10	138 × 296	40,848
11	432 × 814	351,648
12	685 × 523	358,255

36 FOUR-DIGIT ADDITION AND MULTIPLICATION

4. **MULTIPLY BY ONE-DIGIT MULTIPLIERS** using the same procedure you followed to add-list a series of like numbers. In all multiplication problems, record the answer only once. Make a check mark (✓) next to the answer the second time.
5. **MULTIPLY BY TWO-DIGIT MULTIPLIERS** following the procedure listed below for multiplying 487 × 48 (Problem 10):
   a. Set up 487 on the keyboard, and engage the repeat (R) key.
   b. Depress the plus (+) bar or hold down the live (×) key 8 times for the 8 in the multiplier 48.
   c. Depress (E) or (C) key to release the keys for 487, if necessary.
   d. Set up 487 on the keyboard one row to the left of the rows used the first time. This would be the same as depressing the keys for 4870.
   e. Depress or latch down the (R) and (×) key and operate the plus (+) bar, or hold down the live (×) key 4 times for the 4 in the multiplier 48.
   f. Depress the (E) or (C) and take a total.
6. **MULTIPLY BY THREE- OR MORE-DIGIT MULTIPLIERS** by beginning at the extreme right of the multiplier and moving one row to the left for each digit in the multiplier.
7. **IGNORE THE DECIMAL POINT** that is automatically printed except for multipliers with decimals.
8. **COMPLETE ALL PROBLEMS** in this job. Attach the tapes to the left side of the job sheet.
9. **COMPLETE THE TIMED DRILL,** and use Grading Scale No. 4 to determine your grade.
10. **GIVE JOB TO INSTRUCTOR** when completed.

37 WIDE COLUMN ADDITION WITH SUBTOTALS

JOB NO. 37
WIDE COLUMN ADDITION WITH SUBTOTALS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To present the fingering techniques for the addition of five- and six-digit numbers.
2. To present the procedure used to obtain subtotals.

PROCEDURE

1. **CLEAR MACHINE,** and number the problems.
2. **ADD-LIST 178.25** in Problem 1 using the following multiple-key depression technique:
   a. Use the first finger to depress 1 in row five.
   b. Use a second hand motion to depress 7 and 8 in rows four and three.
   c. Use a third hand motion to depress 2 and 5 in rows two and one.
   d. Keep the fourth finger on the plus (+) bar so that it can be depressed at the same time that the last group of keys is depressed.
   e. On the **National Live Keyboard** machine, depress the first two groups of keys only far enough to hold without printing. Be sure to depress the last group all the way down.
3. **OBTAIN SUBTOTAL** by using these two steps:
   a. Depress the subtotal key. It is marked "S," "ST." or "Subtotal," and is usually located at the upper right of the keyboard.

1	2	3	4	5
178.25	158.45	424.52	6,357.93	1,293.50
815.76	836.89	421.36	9,814.95	9,586.45
389.26	749.13	715.79	7,491.45	4,872.12
737.82	527.69	872.97	3,841.59	5,481.79
248.53	368.98	394.67	6,927.31	1,578.97
531.38	186.23	542.98	9,523.94	6,647.89
965.82	749.51	684.19	5,947.58	5,132.75
493.91	267.53	943.51	3,841.59	6,047.89
146.83		282.66	8,156.42	8,543.41
623.48	S	641.95	4,163.95	3,722.45
342.95	196.41	623.79	2,483.47	4,231.67
123.39	348.69	862.43	5,269.14	1,638.32
	637.12		3,145.75	1,718.66
S	938.96	S	2,569.14	2,613.87
512.63	726.31	194.87	3,742.61	9,165.36
729.43	939.36	373.59	1,264.91	7,354.13
341.96	698.13	953.63	4,617.23	9,315.72
952.37	487.19	723.52	9,623.52	6,852.35
432.59	238.69	483.61	1,975.38	2,823.59
283.17	756.38	374.28	3,613.54	1,438.05
676.38		915.31	8,825.61	2,823.95
121.75	S	582.83	1,042.82	4,276.68
	827.52		8,852.61	2,651.89
S	198.91	S	2,137.63	5,485.14
374.25	658.27	291.61	6,751.34	3,522.73
527.84	917.95	442.69	1,946.21	2,814.74
825.83	862.86	573.48	7,923.68	3,612.53
421.73	931.67	123.44	2,467.31	9,783.57
193.28	394.26	437.77	4,196.25	3,353.74
351.76	572.69	275.66	6,321.74	9,149.32
638.43	364.28	718.53	9,237.14	7,732.48
823.49	283.91	543.97	5,731.59	1,359.86
		1 107		

ANSWERS

S _____
S _____
1 _____
S _____
S _____
2 _____
S _____
S _____
3 _____
4 _____
5 _____

JOB NO. 37 / CONTINUED

6	7	8
2,132.75	7,892.50	2,942.25
−168.00	−362.01	−993.10

9	10	11
631.00	370.49	846.37
−31.50	−19.25	−54.26

ANSWERS

6 _____
7 _____
8 _____
9 _____
10 _____
11 _____

TIMED DRILL

Finished at _____ o'clock
Started at _____ o'clock
Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5
49.61	83.12	843.76	293.56	5,981.56
25.73	91.44	962.44	586.45	1,932.46
21.99	24.75	161.92	872.12	3,854.68
83.19	37.32	382.85	481.79	9,133.35
46.84	59.87	135.19	578.97	2,752.58
67.42	15.31	823.73	647.89	8,938.21
14.96	67.49	163.84	543.41	2,298.79
89.62	37.53	254.27	722.45	3,523.69
47.39	25.98	362.59	231.67	5,631.27
51.97	36.43	151.49	638.32	9,514.77
17.46	51.58	632.59	718.66	6,787.23
55.51	27.53	632.59	613.87	5,428.26
97.83	48.21	623.59	165.36	1,754.36
41.45	24.97	342.68	354.13	6,569.71
95.82	95.23	718.53	315.72	5,861.89
806.79	726.76	7,192.06	7,764.37	79,962.81

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37 WIDE COLUMN WITH SUBTOTALS ADDITION

b. Operate the plus (+) bar, if necessary.

4. **ADD-LIST ITEMS** in Problems 1-3 using the same procedure.

5. **ADD-LIST SIX-DIGIT NUMBERS** by splitting the number into convenient groups of two figures. Three hand motions of two keys apiece, give the best result.
   a. Whenever convenient, depress the plus (+) bar along with the last group of keys.

6. **COMPLETE ALL PROBLEMS** in this job. Attach the tapes to the left side of the job sheet.

7. **COMPLETE THE TIMED DRILL,** and use Grading Scale No. 4 on page 187 to determine your grade.
   a. If you have time, do the Timed Drill again. Record your best grade on the Achievement Chart on page 188.

8. **GIVE JOB TO INSTRUCTOR** when completed.

ON THE JOB

Organization pays off.

Organize your work carefully.

38 CREDIT BALANCES AND ZEROS IN MULTIPLIERS

JOB NO. 38
CREDIT BALANCES AND ZEROS IN MULTIPLIERS

Name _____ No. of Errors _____
Period _____ Date _____ Rating _____

AIMS

1. To develop an understanding of credit balance procedures.
2. To introduce the rules that apply to zeros in the multipliers.

PROCEDURE

1. CLEAR MACHINE, and number the problems.

2. OBTAIN CREDIT BALANCE. If the top number of a subtraction is smaller than the bottom number, Problem 1, the difference (answer) will be a credit balance. To get a credit balance, do this:

a. Add the top number, 788.37, as usual.
b. Subtract the bottom number, 960.27, using the minus (—) bar, as usual.
c. Take a total. (On some machines, you must first depress the credit balance release key, located under the total key.)
   (1) If your machine has a credit balance feature, the total will be labeled "C," "Cr.," or (—). Record the answer as 171.90 **Cr.**
d. If your machine does not have a credit feature, the total will be the complement of the credit balance preceded by a series of 9's (999,828.10). The preceding nines indicate that the answer is a credit balance. Do **not** record this answer. To get the true credit balance, do this:
   (1) Enter 999,828.10 on the keyboard, and depress the subtraction (—) bar.
   (2) Take a total. Record the answer as 171.90 **Cr.**

1	2	3	4	5
788.37	929.12	1,796.41	29.79	1.25
—960.27	—1,602.92	—5,899.55	—774.85	—7.85

6	7	8	9	10
516.35	70.88	182.35	644.69	1.02
—675.57	—762.50	—635.66	—885.25	—3.47

11	12	13	14	15
35.66	156.00	205.66	513.44	1.35
146.00—	84.05—	146.00	876.85—	5.14
71.88—	26.78—	35.07	17.66	3.79—
83.44	53.99	417.80—	67.48	6.55
6.77	380.66—	823.05—	390.75—	4.71
367.00—	15.78	150.00	95.10	9.15
1.17	94.55	6.77	49.50	3.74—
25.70	835.06—	724.50—	157.66—	6.98
51.07	36.70	146.77	27.85	9.41
37.80	940.07—	35.45—	56.92	4.76
130.70—	26.77	136.66	323.75	8.64
5.08	115.34	76.89	45.15	7.47
18.00	62.07	235.80	920.60—	9.13
72.00	471.60	194.20—	38.45	9.38
3.88	352.27—	108.48	132.25	2.59—
5.55	32.23	78.50	55.28	3.79
240.60—	75.73	996.53	391.75—	4.28
3.07	123.70	89.93	53.30	9.51
5.60	274.90	174.80—	181.46	3.72
1.66—	559.20—	76.43	64.49	4.86

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____

109

(109)

16 1,247 × 505 _____

17 1,644 × 350 _____

18 2,411 × 407 _____

19	20	21
245.42	379.78	294.82
−589.57	−868.86	−575.83

ANSWERS

16 _____

17 _____

18 _____

19 _____

20 _____

21 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6
395.49	285.23	747.42	1,271.40	157.85	220.85
587.64	574.94	289.57	−3,952.65	−975.61	−735.75
729.63−	868.86−	501.45−			
925.85−	378.78−	104.50−	2,681.25Cr.	817.76Cr.	514.90Cr.
419.76	294.82	341.49			
126.19	829.64	217.28			
371.85−	821.41−	100.50−			
829.41−	575.83−	509.95−			
246.31	976.65	905.25			
957.19−	681.45	411.10−			
656.97−	974.79−	945.50−			
152.64	515.18	210.25			
281.12	194.72	204.75			
952.16−	745.75−	220.85−			
126.19	194.82	901.92			
3,087.72Cr.	1,180.87Cr.	1,024.08			

1 1 0

−1

Multiply:

7 1,589 × 462 734,118

8 1,423 × 683 971,909

9 5,375 × 505 2,714,375

10 8,974 × 753 6,757,422

38 CREDIT BALANCES AND ZEROS IN MULTIPLIERS

(3) Depressing the total key to clear the machine for the next problem will print a credit balance symbol instead of the usual total symbol.

3. **SUBTRACT** items marked with a minus (—) sign and add all others in doing Problems 11-15.
   a. If the numbers added exceed those subtracted, the total will be listed and marked as usual.
   b. If the numbers subtracted exceed those added, the answer will be marked "C," "Cr.," or (—) on machines with a credit balance feature.
   c. On machines without a credit balance feature, a series of 9's will indicate that the answer is a credit balance. To get the true answer, follow the instructions listed under "d" above.
4. **MULTIPLY WITH ZERO.** If a zero occurs at the end of a multiplier, as in 350, move one row to the left and multiply as usual. If a zero occurs in the middle, as in 505, move two rows to the left.
5. **COMPLETE THE TIMED DRILL,** and use Grading Scale No. 4 on page 187 to determine your grade.
   a. If you have time, do the Timed Drill again. Record your best grade on the Achievement Chart on page 188.
6. **ATTACH TAPES** to the left side of the job sheet after you have completed all the problems in this job.
7. **GIVE JOB TO INSTRUCTOR** when completed.

39 COMPARATIVE SALES REPORTS

JOB NO. 39
COMPARATIVE
SALES REPORTS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present practical applications of fingering techniques acquired in previous jobs.

PROCEDURE

1. **SUBTRACT** the number of items in Column (A) from the number of items in Column (B) to determine the amount of increase or decrease.
2. **RECORD INCREASE OR DECREASE.** Place a plus (+) after the difference if the number of items sold this year was larger than last year's. Use a minus (—), if the number of items sold last year exceeded this year's.
3. **COMPLETE COLUMNS.** The first two answers are listed. Do the rest, and write the difference in Column (C).
4. **SUBTRACT** the amount of last year's sales in Column (D) from this year's sales in Column (E). Record the amount of increase or decrease in Column (F).
5. **TOTAL COLUMNS** (A), (B), and (C). Be sure to subtract the items in Column (C) that are marked (—) and to add those marked (+).
6. **PROVE ACCURACY** of your work by subtracting the total of Column (A) from the total of Column (B). The difference should equal the total of Column (C).
7. **TOTAL COLUMNS** (D), (E), and (F) as you did the first three columns.

COMPARATIVE SALES REPORT
January 2, 19__

(A) Items Sold Last Year	(B) Items Sold This Year	(C) Increase (+) Decrease (—)	(D) Sales Last Year	(E) Sales This Year	(F) Increase (+) Decrease (—)
2,888	5,599	2,711 (+)	2,345.75	5,589.72	3,243.97 (+)
8,900	1,236	7,664 (—)	9,507.94	4,465.30	5,042.64 (—)
2,408	6,717		1,006.07	3,751.97	
7,271	7,659		9,272.55	9,890.18	
1,500	3,612		5,427.65	8,025.74	
4,368	3,165		7,117.94	3,152.06	
4,035	2,895		8,829.01	5,405.41	
3,689	4,986		5,840.37	7,831.09	
1,555	3,745		2,905.74	9,064.75	
7,330	5,312		7,315.81	5,401.27	
4,439	8,175		2,679.40	7,192.87	
1,109	1,495		8,972.09	9,240.45	
7,198	3,542		9,095.35	4,861.24	
4,677	7,125		4,278.45	7,426.85	
2,446	3,573		6,094.94	9,670.19	
2,639	5,789		3,507.41	8,059.07	
5,518	2,941		9,645.05	5,944.56	
2,880	6,125		1,875.23	7,304.25	
7,052	3,421		5,280.49	2,786.32	
8,039	4,193		9,419.86	4,539.47	
8,805	8,900		7,931.76	7,995.18	
6,051	7,128		4,395.98	6,806.47	
3,249	2,495		9,675.07	7,027.05	
2,497	9,513		1,145.75	9,751.41	
4,522	4,786		5,174.75	6,670.89	
1,711	4,913		1,673.42	5,749.07	

JOB NO. 39 / CONTINUED

WEEKLY SALES REPORT
January 2, 19__

1 Last Week's Sales	2 This Week's Sales	3 Increase (+) Decrease (—)
405.48	307.36	98.12—
150.84	406.46	
205.13	130.38	
220.19	306.72	
306.36	103.57	
261.27	323.12	
252.14	216.14	
516.36	471.37	
445.63	137.72	
561.15	126.65	
550.11	120.43	
120.56	106.12	

ANSWERS

Column 1 _____

Column 2 _____

Column 3 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3
320.27	542.50	253.63
185.66	284.06	562.11
207.10	726.13	245.23
328.23	215.40	868.06
989.76	456.16	355.32
410.65	807.03	463.19
623.46	165.68	276.10
570.73	604.32	370.66
832.84	395.74	267.24
752.02	637.36	712.52
160.70	903.96	309.34
5,381.42	5,738.34	4,683.45

112

4	5	6
380.32	603.25	612.54
—163.10	—427.09	—423.67
217.22	176.16	188.87

7 148 × 181 = 26,788

8 547 × 124 = 67,828

9 789 × 267 = 210,663

10 843 × 378 = 318,654

39 COMPARATIVE SALES REPORT

8. **PROVE ACCURACY** of your work by subtracting the total of Column (D) from the total of Column (E). The difference should be the same as the total of Column (F).
9. **COMPLETE WEEKLY SALES REPORT** at the top of page 112 by following the same procedure.
10. **COMPLETE THE TIMED DRILL** as usual, and use Grading Scale No. 4 on page 187 to determine your grade.
    a. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.
11. **ATTACH TAPES** to the left side of the job sheet after completing all the problems of this job.
12. **GIVE JOB TO INSTRUCTOR** when completed.

ON THE JOB

Your time costs money.

Work rapidly with no wasted motion.

40 REVIEW

VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

JOB NO. 40 REVIEW

Name _____
Period _____ Date _____
No. of Errors _____ Rating _____

Time Completed _____
Time Started _____
Minutes Required _____

AIMS:

1. To review the operating principles presented in Job Nos. 31 through 39.
2. To determine the proficiency acquired in the operation of full-keyboard adding listing machines.

PROCEDURE

1. **CLEAR MACHINE,** and number each problem.
2. **DO EACH PROBLEM** only once. Record the answer directly below or beside each problem, and in the Answers column at the right.
3. **RECORD TIME** the job was started, the time it was completed, and the number of minutes required to complete the job in the spaces provided. In recording the time, drop fractions of a minute smaller than ½. Fractions larger than ½ minute but less than one full minute are recorded as ½ minute. Subtract to get the time required for completion of the job.
4. **DO JOB AGAIN,** if you have the time. Try to improve your speed.
5. **ARRANGE THE TAPES** in numerical order, and attach them to the upper left corner of the job sheet.
6. **WRITE YOUR NAME** and other information required in the spaces provided at the upper center of the job sheet.
7. **GIVE JOB TO INSTRUCTOR** when completed.

1	2	3	4	5
8.23	6.50	72.44	862.68	9,251.45
7.32	3.04	61.95	671.93	9,251.45
6.54	9.70	76.62	624.39	9,251.45
9.21	1.03	73.52	692.75	9,251.45
9.13	7.40	94.19	273.61	9,251.45
7.43	8.05	83.45	824.36	9,251.45
8.24	1.20	85.96	193.28	2,542.36
7.11	9.04	38.45	254.24	1,953.17
9.35	5.60	74.24	631.62	5,134.63
6.33	8.07	61.78	975.17	2,157.65
7.45	3.40	93.16	792.78	8,367.56
9.12	6.08	72.49	764.93	5,981.74
7.23	3.10	81.27	892.54	5,981.74
8.54	2.07	73.29	914.68	5,981.74
9.12	5.20	94.12	153.49	5,981.74
6.13	8.09	51.89	626.82	5,981.74
9.35	1.40	31.75	591.46	5,981.74
8.35	6.07	51.98	973.52	2,752.58
6.24	3.50	52.78	342.68	8,938.21
7.21	2.04	71.57	787.19	2,298.79
8.34	7.05	92.36	953.37	3,524.69
9.32	2.60	83.48	362.59	5,631.27
6.22	5.01	73.21	254.27	9,514.77
9.24	8.40	94.35	613.84	6,787.23
7.32	9.70	74.24	824.36	1,953.17
7.11	9.04	35.45	254.24	1,954.17
6.33	8.07	93.16	631.62	5,234.25
2.45	5.60	64.25	273.61	1,943.20
8.24	9.04	61.78	764.93	3,145.75
9.21	3.04	83.54	892.25	2,846.01

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____

VISUALLY-OPERATED, FULL-KEYBOARD ADDING LISTING MACHINE

JOB NO. 40 / CONTINUED

6	7	8	9	10	11
8.24	172.44	862.68	17.43	183.45	973.52
−7.11	−61.95	−671.93	−19.13	−71.29	−342.68

12 579 × 276 _____

13 368 × 351 _____

14 267 × 487 _____

15 912 × 635 _____

16 643 × 1.56 _____

17 923 × 4.87 _____

18 597 × 5.21 _____

19 371 × 5.11 _____

20

1,754.93	3.46	8.63	73.14
1.57	6.57	31.46	.26
2,147.81	19.42	.61	18.54
49.78	.37	11.23	12.69
321.72	17.51	23.82	7,925.91
4,216.91	21.23	4,817.34	S
6.32	2,681.56	1,384.92	169.54
1,845.96	8,532.64	275.38	2.65
6,367.23	176.85	15.69	.92
173.59	18.25	.13	6,172.81
4.21	.96	5,716.45	91.38
.13	S	89.26	.72
748.42	62.95	1.75	1,948.96
2.95	1.25	2,359.17	2.69
.25	2,694.51	5.74	9,628.36
2,694.51	11.62	4,842.15	8.53
1.62	1,641.93	49.82	7,524.61
1,641.93	89.26	S	32.49
93.16	5,733.97	984.49	17.93
S	536.82	3.58	1,459.87
257.45	8.13	2,725.53	132.45
7.32	856.24	.18	
2,347.75	.62	68.31	114
.68	48.35	2.35	
24.63	3.17	9.87	

40 REVIEW

NOTE: Before proceeding to the next job, ask your instructor about Test No. 8. Test Nos. 7 and 8 should be completed before you start another job.

ANSWERS

6 _____

7 _____

8 _____

9 _____

10 _____

11 _____

12 _____

13 _____

14 _____

15 _____

16 _____

17 _____

18 _____

19 _____

S _____

S _____

S _____

S _____

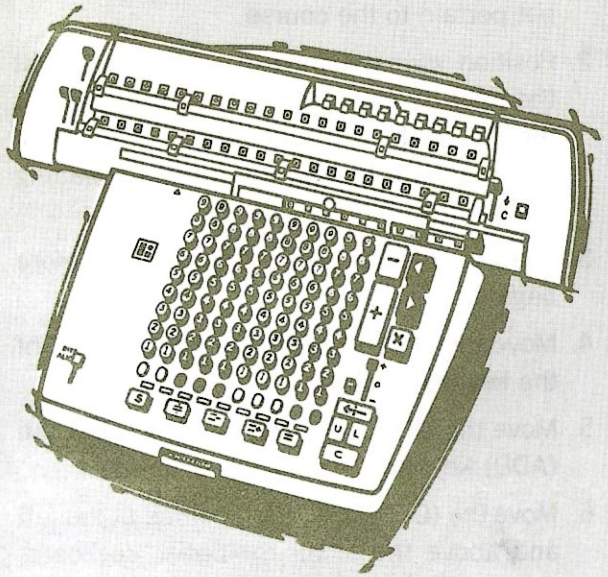
20 _____

ON THE JOB

Know your machine.

Your machine can help you perform better at your job.

OFFICE MACHINES COURSE



VISUALLY-OPERATED, ROTARY CALCULATOR

HIGHLIGHTS

Rotary calculators can be used to add, subtract, multiply, and divide. The rotary calculator can easily perform operations involving many digits and is particularly efficient in multiplication and division processes. Rotary calculators may be classified as fully automatic, semi-automatic, and hand-operated. Because hand-operated models are rarely used in today's modern offices, only instructions for electrically operated models will be given.

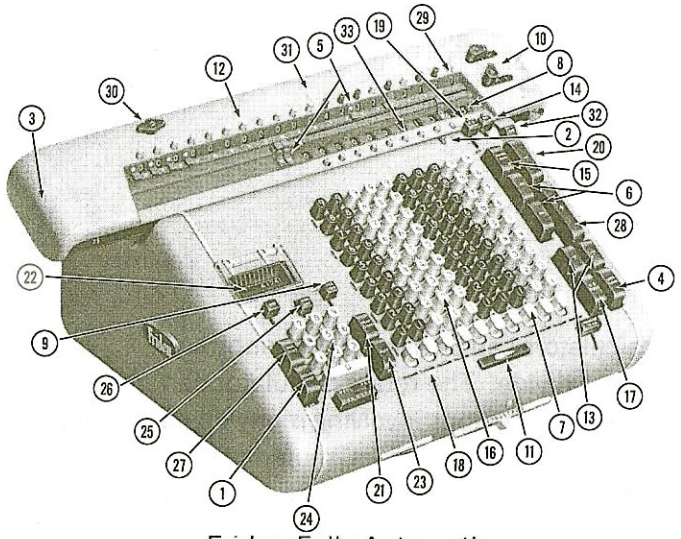
The rotary calculators that will be described in this book are the **Friden, Marchant,** and **Monroe** calculators. The most prominent feature of these calculators is a movable carriage with two sets of "rotating" dials. The long dial is known as the "register" dial. The short dial is called the "counter" dial. Answers to the computations are shown in these dials as the rotary calculator does not print solutions on a paper tape.

The keyboard may have 7, 8, 10, or more columns of keys, each of which begins with 1 at the end nearest the operator and ascends to 9 at the opposite end.

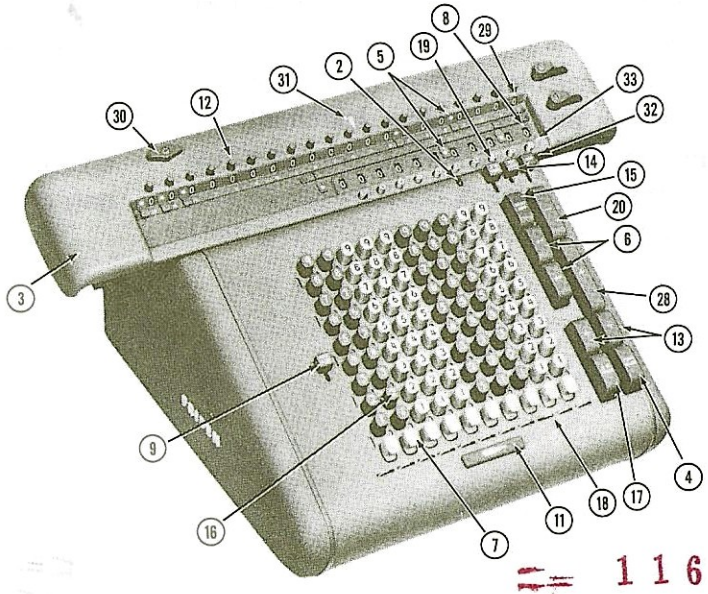
The arrangement of the keys on the keyboard of a rotary calculator makes possible the multiple-key depression technique which enables an operator to depress two or more keys with only one or two hand motions.

115

PART NO.	MACHINE PARTS
1	Accumulative Multiplier Key
2	Active Dial Indicator
3	Carriage
4	Carriage Clear Keys
5	Carriage Dials Decimal Markers
6	Carriage Direction Control Keys
7	Column Lock and Clear Keys
8	Counter Dials
9	Counter Dials Control Lever
10	Counter Dials Lock
11	Decimal Point Clear Key
12	Dial Twirlers
13	Divide Keys
14	Division Stop Key
15	Enter Dividend Key
16	Keyboard
17	Keyboard Clear Key
18	Keyboard Decimal Marker
19	Keyboard Lock Lever
20	Minus Bar
21	Multiplier Clear Key
22	Multiplier Dials
23	Multiplier Key
24	Multiplier Keyboard
25	Multiplier Non-Entry Lever
26	Multiplier Repeat Key
27	Negative Multiplier Key
28	Plus Bar
29	Register Dials
30	Register Dials Lock
31	Register Dials Split Indicator
32	Repeat Key
33	Tabulator Keys



Friden Fully Automatic



Friden Semi-Automatic

116

PREPARING THE FRIDEN FOR ADDITION

1. Clear your desk or table of materials that do not pertain to the course.
2. Position your machine at a slight angle at the right of your desk. Place this book at the left of the machine. Move both book and machine to give you ease of reading and writing.
3. Read all the instructions for a job before beginning it.
4. Move the (ADD) key, located at the right of the keyboard, **down**.
5. Move the (KB LOCK) key, located near the (ADD) key, **up**.
6. Move the (CTR CON) key, located at the left and above the small multiplier keyboard, **up**.
7. Turn the lower dials lock and the upper right dials lock, located at the right of the carriage, to a horizontal or unlocked position. Do the same for the upper left dials lock, located at the upper left of the carriage. This makes it possible to clear all answer dials.
8. **Clear** the machine:
   a. Using the first and second fingers, simultaneously depress the (CARR CLEAR) and (KB CLEAR) keys, located at the lower right of the large keyboard.
   b. On **semi-automatic Fridens**, in the same way, depress the (CARR CLEAR and RETURN) and (KB CLEAR) keys.

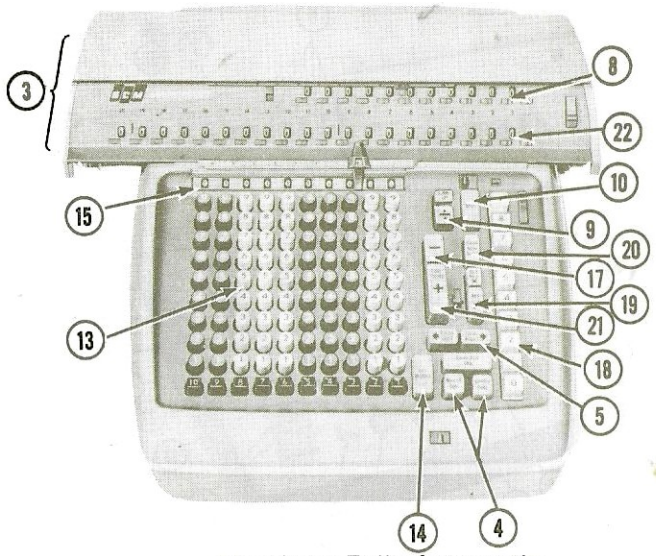
(116)

PREPARING THE MARCHANT FOR ADDITION

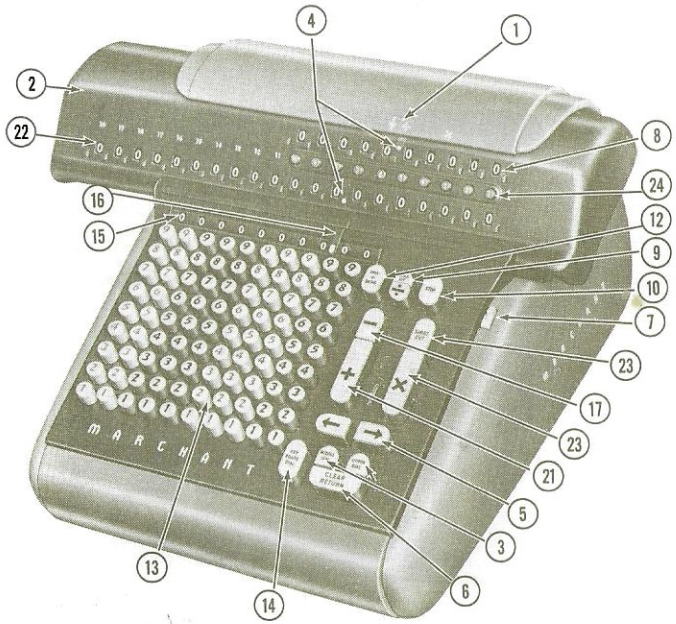
1. Clear your desk or table of materials that do not pertain to the course.
2. Position your machine at a slight angle at the right of your desk. Place this book at the left of the machine. Move both book and machine to give you ease of reading and writing.
3. Read all the instructions for a job before beginning it.
4. Depress shift key with arrow pointing to left (←) to move the carriage to the number (1) position. Carriage shift keys are located at the right of the keyboard.
5. On the **Marchant Deci-Magic,** depress the zero (0) tab key, located below the number one keys of the keyboard.
6. Move the counter dial control lever, located at the extreme upper right of the keyboard, away from you — **up**.
7. Push left and right dials lock levers up. These are located on either side of the carriage.

   On the **Marchant Deci-Magic**, push levers in.
8. **Clear** the machine. With the first three fingers of the right hand, simultaneously depress (UPPER DIALS), (MIDDLE DIAL), and (KEYBOARD DIAL) or (LOCK OR CLEAR) keys, located at the lower right of the machine.

VISUALLY-OPERATED, ROTARY CALCULATOR



Marchant Fully Automatic



Marchant Semi-Automatic

PART NO.	MACHINE PARTS
1	Active Dial Indicator
2	Carriage
3	Carriage Clear Keys
4	Carriage Dial Decimal Markers
5	Carriage Direction Control Keys
6	Carriage Return Key
7	Counter Dial Control
8	Counter Dials
9	Divide and Alignment Keys
10	Divide Stop Key
11	Division Clear-Return Lever
12	Enter Dividend Key
13	Keyboard
14	Keyboard Clear Key
15	Keyboard Dials
16	Keyboard Decimal Marker
17	Minus Bar
18	Multiplier Keyboard
19	Negative Multiplier Key
20	Non-Shift Key
21	Plus Bar
22	Register Dials
23	Repeat Key
24	Tabulator Keys

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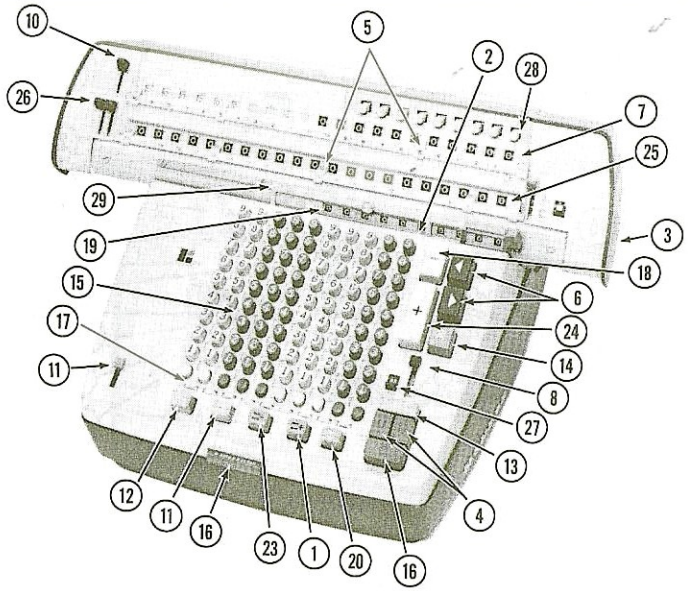
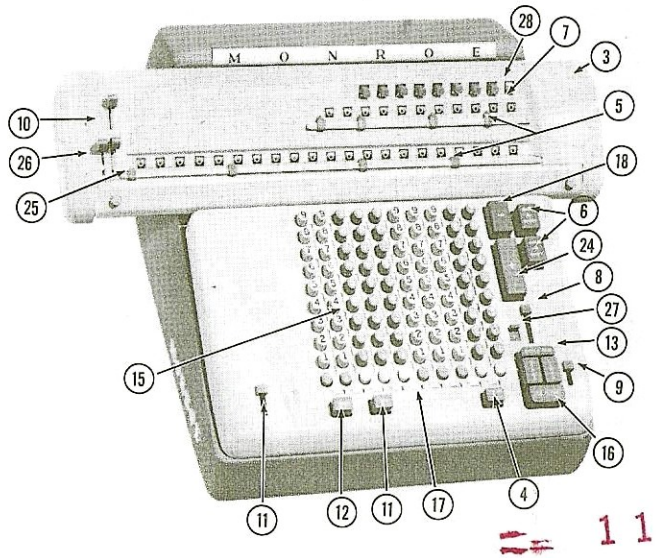
VISUALLY-OPERATED, ROTARY CALCULATOR

PART NO. MACHINE PARTS

1 Accumulative Multiplier Key
2 Active Dial Indicator
3 Carriage
4 Carriage Clear Keys
5 Carriage Dial Decimal Markers
6 Carriage Direction Control Keys
7 Counter Dial
8 Counter Dial Control Lever
9 Counter Dial Control Lock Lever
10 Counter Dial Lock
11 Divide and Alignment Keys
12 Divide Stop Key
13 Enter Dividend Key
14 Enter Multiplier Key
15 Keyboard
16 Keyboard Clear Key
17 Keyboard Decimal Markers
18 Minus Bar
19 Multiplier Dials
20 Multiplier Key
21 Multiplier Non-Entry Lever
22 Multiplier Repeat Key
23 Negative Multiplier Key
24 Plus Bar
25 Register Dials
26 Register Dial Lock
27 Repeat Key and Non-Repeat Key
28 Tabulator Keys
29 Transfer Slide



Monroe Fully Automatic



Monroe Semi-Automatic

118

PREPARING THE MONROE FOR ADDITION

1. Clear your desk or table of materials that do not pertain to the course.
2. Position your machine at a slight angle at the right of your desk. Place this book at the left of the machine. Move both book and machine to give you ease of reading and writing.
3. Read all the instructions for a job before beginning it.
4. Depress shift key with arrow pointing to left (←) to move carriage to number (1) position. Shift keys are located at upper right of keyboard.
5. Move the counter control lever, located under the (+) bar, to (×).
6. Move repeat-non-repeat lever to (NR) position or depress unmarked key above the (R) key. These devices are located under the (+) bar.
7. Move both the upper and lower dials lock levers **up**. These levers are located at the left of the carriage dials.
8. **Clear** the machine:
   a. With the first two fingers of the right hand, simultaneously depress the (UPPER), (LOWER), and (KB CLEAR) keys located at lower right of the machine.
   b. On some semi-automatic models, just depress the (CLEAR-MULT) key located at the left of the (KB CLEAR) key.

41 ADDITION — VISUALLY OPERATED

JOB NO. 41
ADDITION — VISUALLY OPERATED

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present the techniques used to add numbers.

PROCEDURE

1. **CLEAR MACHINE.** Prepare calculator for addition.
2. **DEPRESS THE 4 KEY** in the first row at the extreme right with the first finger of the right hand.
3. **ADD THE NUMBER** by depressing the plus (+) bar with the fourth finger. Number 4 will appear in the **register** dials and 1 in the **counter** dials.
4. **DEPRESS TWO (4) KEYS** simultaneously in the first and second rows at the extreme right with the first and second fingers.
5. **DEPRESS PLUS (+) BAR.** Number 48 will appear in the register dials, and 2 in the counter dials.
6. **DEPRESS THREE (4) KEYS** simultaneously in the first three rows with the first, second, and third fingers.
7. **DEPRESS PLUS (+) BAR.** Number 492 will appear in the register dials, and 3 in the counter dials.
8. **ADD REMAINING NUMBERS** in Problem 1 following the same procedure.
9. **WRITE THE ANSWER** directly below the problem. The answer to Problem 1 is 1,845. (Problems 2 and 3 should be 1,980 and 3,180 respectively.) Clear the machine, and immediately do the problem a second time. In reading the numbers the second time, begin at the bottom and work up.

Similar-digit numbers — depress keys simultaneously with first and second fingers or with first, second, and third fingers.

1	2	3	4	5	6
4	444	666	505	440	666
44	44	600	55	40	606
444	40	6	5	44	66
5	555	555	404	550	555
55	55	500	44	50	505
555	50	5	4	55	55
6	666	444	606	660	444
66	66	400	66	60	404
666	60	4	6	66	44

Dissimilar-digit numbers — depress keys simultaneously with first and second fingers, or with first finger and thumb.

7	8	9	10	11	12
44	404	46	406	444	46
45	405	64	604	405	406
54	504	45	405	555	64
55	505	56	506	506	604
56	506	46	406	666	45
65	605	64	604	606	405
66	606	56	506	555	444
45	405	45	405	604	505
54	504	46	406	406	406

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____

JOB NO. 41 / CONTINUED

Dissimilar-digit numbers — depress keys simultaneously with the first or second finger and the thumb.

13	14	15	16	17	18
41	401	55	66	47	58
14	104	15	16	74	85
44	404	51	61	57	18
11	101	11	11	75	81
14	104	15	16	67	48
41	401	51	61	76	84
44	404	55	66	17	68
14	104	15	16	71	86
41	401	51	61	77	88

19	20	21	22	23	24
82	69	59	34	304	609
28	96	95	43	602	906
24	79	49	23	203	709
42	97	94	32	302	907
25	89	36	13	103	809
52	98	63	31	301	903
27	29	35	38	308	209
72	92	53	83	803	902
77	19	37	39	309	109
62	91	73	93	903	901

ANSWERS

13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____

= 120

40 ADDITION — VISUALLY OPERATED

a. If the second answer is the same as the first, write it in the Answer column at the right.
b. If the second answer is different from the first, write it below the first answer; and do the problem again. Write the answer that proves to be correct in the Answers column.

FINGERING TECHNIQUES

Rotary calculators are visually operated. **Look** for and depress the keys for the figures in each addend. Zeros are not depressed; skip the row in which zeros are to be indexed.

To develop speed in indexing, use the multiple-key depression fingering technique—depress two or more keys at once.

1. To add numbers containing one digit such as 9, 10, 200, 3000 (since zeros are not depressed, they are not counted as digits), depress the proper figure key with the first or index finger and the plus (+) bar with the fourth or little finger.
2. To add numbers containing two digits, when the two digits are the same, or when the **right** digit is not more than three greater than the left digit such as: 88, 89, 79, 69, 609, depress the keys for both digits **simultaneously**, using the first and second fingers.
3. To add numbers containing two digits, when the **left** digit is larger than the right one, such as: 54, 64, 74, 704, **simultaneously** depress the key for the left digit with the first or second fingers and the key for the right digit with the thumb.
4. To add all other numbers containing two digits such as: 27, 38, 19, 208, depress the keys for both digits **simultaneously**, using the thumb on the lower digit key and either the first or second fingers on the upper digit key.

40 ADDITION — VISUALLY OPERATED

5. To add three-digit numbers such as: 115, 227, 338, 822, 733, depress the two similar keys by centering the thumb over them and either the first or second fingers to depress the other figure key.
6. To add other three-digit numbers, such as: 415, 741, 571, 154, depress the key for the left digit with the first finger. Use a second hand motion to depress the keys for the remaining two digits, following the instructions given above for adding two-digit numbers.

CORRECTIONS

If you make a mistake in depressing the keys for a number and discover it before adding the number, correct it by:

1. Depressing the correct key, if the error is in the same column.
2. Depressing the individual column correction key, at the bottom of the keyboard, or **lightly** depressing any two keys in the same column to eliminate an error in a single column.
3. Depress the keyboard clear key, located at the lower right of the machine, to eliminate the entire number from the keyboard.

JOB NO. 41 / CONTINUED Name_____ Period_____

Three-digit numbers with two similar digits — depress **simultaneously** the two left digits with the thumb and the other with the first finger.

25	26	27	28	29	30
445	113	669	115	449	445
556	224	558	226	338	113
667	335	447	337	227	669
778	446	336	448	116	115
889	557	225	559	559	449
334	668	114	669	669	448
223	779	779	115	449	224
112	889	889	226	338	558
556	113	669	337	227	226
667	224	558	448	116	338

Other three-digit numbers — depress left digit with first finger; other two with the thumb and first or second fingers.

31	32	33	34	35	36
415	941	851	518	494	125
741	149	164	178	266	856
571	816	561	416	547	594
154	761	418	167	812	415
841	197	815	154	537	274
451	741	471	671	961	348
754	817	541	695	453	915
817	167	915	596	146	513
571	174	591	965	913	624
481	514	651	459	731	312

ANSWERS

25 _____
26 _____
27 _____
28 _____
29 _____
30 _____
31 _____
32 _____
33 _____
34 _____
35 _____
36 _____

121

JOB NO. 41 / CONTINUED

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6
448	984	465	325	123	195
135	247	137	673	789	284
453	764	991	794	482	362
784	891	876	218	297	476
249	571	572	357	276	398
119	326	346	681	681	159
462	549	988	346	593	378
763	127	655	895	364	487
792	684	461	357	387	178
354	338	126	674	275	393
658	891	787	135	593	267
357	674	455	989	494	592
217	557	671	323	266	379
874	357	982	441	253	164
884	352	652	944	537	146
7,549	8,312	9,164	8,152	6,410	4,858

122

40 ADDITION — VISUALLY OPERATED

When all problems have been completed:

1. COMPLETE THE TIMED DRILL.

a. In the spaces provided, record the starting and finishing time. Drop fractions of a minute smaller than ½. Fractions larger than ½ minute but less than one full minute are recorded as ½ minute. Subtract to get the time required for completion of the drill.
b. Do each problem **only once.**
c. Place a check mark (✓) next to the answer if your answer is correct, an (X) if incorrect.
d. Count errors (X's), and use the Scale No. 2 on page 187 to determine your grade.
e. If you have time, do the Timed Drill again. Try to improve your speed.
f. Record your best grade on the Achievement Chart on page 188.

2. FILL IN INFORMATION

in the heading at the top of page 119, and give the completed job sheet to your instructor.

42 WIDE COLUMN ADDITION AND REPEAT ADDITION

JOB NO. 42
WIDE COLUMN AND REPEAT ADDITION

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To introduce the fingering techniques for four-, five-, and six-digit addends.
2. To present the procedures for using the repeat (R) key, the multiplication (×) bar, and multiplier keys in repeat addition.

PROCEDURE

Wide Column Addition

1. **CLEAR MACHINE.** Prepare your calculator for addition.
2. **SET DECIMAL MARKER.** When a problem contains decimals, move or flip over a decimal marker on the keyboard and register dials so that they correspond with the position of the decimal point in the problem. For most addends, the decimal marker should be placed between columns 3 and 2.
3. **ADD FOUR-DIGIT NUMBERS** such as 44.88, 13.57, 45.35, using two separate hand motions to depress two keys at a time, following the instructions in Job No. 41 for adding two-digit numbers.
4. **ADD FIVE-DIGIT NUMBERS** such as 135.67 by following these steps:
   a. Use the first finger to depress 1 in column 5.
   b. Use the first and second fingers to depress, **simultaneously**, 35 in columns 4 and 3, and with another hand motion, depress, **simultaneously**, 67 in columns 2 and 1.
   c. Depress the plus (+) bar with the little finger.
5. **ADD SIX-DIGIT NUMBERS** such as 4,175.96 by dividing the number into three 2-digit groups. Use the fingering techniques developed in Job No. 41 to depress **simultaneously**, 41, in columns 6 and 5; 75, in columns 4 and 3; and 96, in columns 2 and 1. Depress the plus (+) bar with the little finger.

Wide Column Addition.

1	2	3	4	5
44.88	98.43	135.67	132.48	4,175.96
13.57	24.79	236.14	631.16	5,589.72
45.35	76.46	542.38	216.23	7,304.25
78.46	89.12	413.11	540.25	9,240.45
24.98	57.13	169.92	715.94	4,243.17
11.99	32.68	701.82	451.15	8,025.74
46.24	54.98	451.15	401.06	9,465.30
76.32	12.78	302.35	369.40	2,786.32

Repeat Addition.

6	7	8	9	10
21.98	713.62	4,017.51	2.74	25.45
21.98	713.62	4,017.51	2.74	25.45
21.98	713.62	4,017.51	2.74	25.45
21.98	185.48	4,017.51	2.06	25.45
21.98	185.48	5,401.27	2.06	25.45
91.71	185.48	5,401.27	2.06	98.32
91.71	185.48	5,401.27	2.06	98.32
91.71	185.48	5,401.27	2.06	98.32

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

1 2 3

JOB NO. 42 / CONTINUED

INSTRUCTIONS

1. Do each problem **only once**.
2. Place a check mark (✓) next to the answer if your answer is correct; an (X) if incorrect.
3. Count (X's) and use Grading Scale No. 2 on page 187 to determine your grade.
4. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

WEEKLY SALES REPORT — FIRST WEEK IN JANUARY 19__				
Eastern District	Western District	Northern District	Southern District	Central District
306.28	1,691.87	293.25	3,180.64	436.06
246.36	3,874.66	947.40	1,490.63	683.07
163.42	4,501.29	436.06	2,353.14	831.66
809.12	1,194.02	317.18	3,481.30	345.75
432.17	1,206.43	662.66	4,301.57	194.02
353.14	2,453.86	541.04	3,851.96	317.18
191.31	2,324.61	820.40	1,189.64	714.33
341.25	3,378.52	238.09	2,201.08	812.16
508.16	1,440.68	702.83	4,100.23	206.43
638.61	1,616.74	836.32	1,932.86	258.63
3,989.82	23,682.68	5,795.23	28,083.05	4,799.29

= 124

42 WIDE COLUMN ADDITION AND REPEAT ADDITION

REPEAT ADDITION

1. **CLEAR MACHINE.**
2. **ENTER FIGURES.** To repeat-add 21.98 five times, depress 21.98 on the keyboard and on:
   a. **Friden**, move (ADD) key up and depress the plus (+) bar five times.
   b. **Marchant**
      (1) On fully-automatics, depress **simultaneously** the plus (+) bar and the "5" multiplier key located at the right of the keyboard.
      (2) On semi-automatics, depress the multiplication (×) bar five times.
      (3) On Deci-Magic, depress the keyboard (LOCK) key and tap the plus (+) bar five times.
   c. **Monroe,** move lever to (R) or engage (R) key and depress the plus (+) bar 5 times.
3. **CLEAR THE KEYBOARD,** and follow the same procedure for the next series of like numbers.
4. **COMPLETE THE TIMED DRILL.**
5. **GIVE JOB TO INSTRUCTOR** when completed.

43 SUBTRACTION AND CREDIT BALANCES

JOB NO. 43
SUBTRACTION AND
CREDIT BALANCES

Name _____ No. of Errors _____
Period _____ Date _____ Rating _____

AIMS:

1. To present the use of the minus (—) key to subtract.
2. To present the procedure followed to get a credit balance (—).

PROCEDURE

Subtraction

1. CLEAR MACHINE. Prepare your calculator for addition.

2. SUBTRACT in Problems 1-15 following the procedure given below for Problem 1.

a. Index top number, 3.50, and depress the plus (+) bar.
b. Index number to be subtracted, 1.25, and depress the minus (—) bar.
c. Record the remainder, 2.25, in the space provided under the problem. **Do not** clear the dials.
d. Verify the answer by adding the subtrahend, 1.25, to the answer, 2.25, which is still in the register dials.
e. If the dials show 3.50, the minuend, the answer has been verified and should be recorded in the Answers column at the right. If the dials do not show 3.50, do the problem again.
f. Clear the machine, and do the remaining problems.

Credit Balances

If the bottom number is bigger than the top number, Problems 16-25, the register dials will signal a credit balance by listing a series of 9's to the left of the complement of the answer.

To subtract, add the top number as usual ..... + 3.50
Index the bottom number, and depress minus (—) bar ..... — 1.25
2.25
To verify the answer, add back the bottom number ..... + 1.25

1	2	3	4	5
3.50	7.90	8.72	3.69	6.12
—1.25	—3.75	—.15	—1.46	—.86

6	7	8	9	10
5.50	7.14	80.80	90.94	81.75
—.47	—2.68	—2.19	—60.25	—3.73

11	12	13	14	15
12.25	25.08	9.07	36.01	15.05
—7.50	—14.59	—4.80	—17.26	—7.00

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

125

JOB NO. 43 / CONTINUED

Obtain the credit balance:

16	17	18	19	20
7.50	5.08	4.80	17.26	9.25
−12.25	−14.59	−19.09	−56.02	−15.05

21	22	23	24	25
8.13	15.57	3.44	.79	13.57
−12.08	−25.00	−6.97	−1.50	−31.98

Adding debits and credits:

26	27	28	29	30
9.35	−23.72	14.83	−19.17	18.82
−4.92	9.40	−4.14	8.09	−5.35
−16.05	−2.20	−20.90	21.81	−2.11
.22	4.80	9.49	9.62	16.69
8.23	−12.32	7.57	−20.24	3.42
−23.61	1.90	21.62	19.36	−95.40
2.43	10.63	1.60	−89.35	6.97

ANSWERS

16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____

43 SUBTRACTION AND CREDIT BALANCES

To get the credit balance, follow this procedure:

1. **ENTER FIGURES.** On all calculators, depress the same keys as the figures appearing in the register dials directly above each row of keys. In Problem 16, those will be 9999525, or 525 preceded by as many 9's as there are additional rows of keys on the keyboard. To get the true credit balance:
   a. On **Friden**, move (ADD) key **up** and subtract twice.
   b. On **Marchant Semi-Automatic**, depress the (SHORT CUT) key twice.
   c. On **Marchant Fully Automatic**, depress, **simultaneously**, the minus (—) bar and the "2" multiplier key at the right of the keyboard.
   d. On **Marchant Deci-Magic**, depress the (MD CLEAR) key and the minus (—) bar.
   e. On **Monroe**, depress the repeat key and subtract twice.

   On all calculators, the first step clears the register dials and the second step produces the true credit balance, 4.75.
2. **RECORD ANSWER,** 4.75 **Cr.**, under Problem 16, but **do not** clear the dials.
3. **VERIFY THE ANSWER** by clearing the keyboard, if necessary, and adding the top number, 7.50. If the dials show 12.25, the answer has been verified and should be recorded in the Answers column.
4. **CLEAR THE MACHINE.** (On **Friden**, move the (ADD) key down; and on **Monroe**, release the repeat key.) Do the next problem.

43 SUBTRACTION AND CREDIT BALANCES

Adding Debits and Credits

In Problems 26-30, credits, items preceded by a minus (—) sign, should be subtracted; all other items, debits, should be added. When the minuses exceed the pluses, the register dials will show a long series of 9's. These should be ignored until **all** items have been entered. If the register dials show a series of 9's after all items have been entered, then the credit balance procedure described above should be followed. The answer for Problem 26 is 24.35 **Cr.** To verify the accuracy of the answer, do the problem again.

Customers' Accounts

To determine the balance for each line, follow the steps listed below for Problem 31.

1. **ADD 450.15** and subtract 2.35.
2. **LIST THE BALANCE,** 447.80, on the first line. **Do not** clear the dials.
3. **ADD 12.35** and subtract 146.85.
4. **LIST THE BALANCE,** 313.30, on the second line. Do not clear the dials.
5. **SUBTRACT 450.15.** The dials will show a series of 9's and 863.15 (9999863.15).
6. **DEPRESS KEYS** on the keyboard for all figures appearing in the register dials directly above each row of keys.
7. **SUBTRACT** twice and list the credit balance, 136.85 Cr., on line 3. If necessary, see page 126 for the steps to follow to obtain a credit balance.
8. **COMPLETE PROBLEMS** 32, 33, and 34 following the same procedure.

JOB NO. 43 / CONTINUED Name _____ Period _____

ANSWERS

31 _____ 33 _____

32 _____ 34 _____

CUSTOMERS' ACCOUNTS

31

Charges	Credits	Balance
450 15	2 35	
12 35	146 85	
	450 15	

32

Charges	Credits	Balance
350 00	214 68	
214 68	250 00	
1 75	1 75	
986 50	25 00	
45 60		

33

Charges	Credits	Balance
175 00	15 00	
15 80	175 00	
65 75	50 00	
106 30	25 00	
478 15	75 00	

34

Charges	Credits	Balance
175 85	1 25	
13 50	50 00	
482 12	100 00	
500 00		
655 10		1 2 7

JOB NO. 43 / CONTINUED

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock
minutes
Subtract _____ required

TIMED DRILL

Comparative Data

1. Add number in columns labeled "This Year."
2. Subtract number in columns labeled "Last Year."
3. Record the remainder in columns labeled "Amount of Increase."

SALES (Dollars Only)			NET PROFIT (Dollars Only)		
This Year	Last Year	Amount of Increase	This Year	Last Year	Amount of Increase
(1) 21,236	11,173	10,063	(11) 26,535	19,051	7,484
(2) 17,271	15,923	1,348	(12) 13,684	11,249	2,435
(3) 36,872	25,249	11,623	(13) 14,035	10,497	3,538
(4) 16,555	16,051	504	(14) 24,368	21,522	2,846
(5) 27,330	25,805	1,525	(15) 18,556	18,105	451
(6) 14,439	14,009	430	(16) 14,255	12,499	1,756
(7) 21,109	10,052	11,057	(17) 17,260	16,672	588
(8) 41,198	38,770	2,428	(18) 26,645	25,142	1,503
(9) 14,677	13,518	1,159	(19) 17,320	15,062	2,258
(10) 12,446	12,001	445	(20) 26,318	24,407	1,911

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43 SUBTRACTION AND CREDIT BALANCES

After working all problems:

1. **COMPLETE THE TIMED DRILL.**
   a. Do each subtraction **only once.**
   b. Place a check mark (✓) next to the "Increase" if your answer is correct; an (X) if incorrect.
   c. Count (X's) and use Grading Scale No. 3 on page 187 to determine your grade.
   d. If you have time, do the Timed Drill again. Record your best grade on the Achievement Chart on page 188.
2. **GIVE JOB TO INSTRUCTOR** when completed.

ON THE JOB

Concentrate when you work.

Inaccuracies result from inattention.

44 MULTIPLICATION OVER FIXED DECIMAL POINTS

JOB NO. 44 MULTIPLICATION OVER FIXED DECIMAL POINTS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present the use of a fixed decimal point to insure accuracy and save time in multiplication problems involving whole numbers and decimals.

PROCEDURE

1. CLEAR MACHINE. Prepare calculator for multiplication.

a. **Friden** — Move (ADD) key **up**, and shift carriage to extreme left.

b. **Marchant** — Shift the carriage to the extreme left. Move carriage direction control, which is above the multiplier keys, to **left**.

c. **Monroe** — Depress (R) key, or move lever to (R), and shift the carriage to the extreme left.

2. SET FIXED DECIMAL MARKERS at:

a. Keyboard, between rows 5 and 4.

b. Counter dials, between 5 and 4.

c. Register dials, between 9 and 8.

d. **Friden** multiplier, over 4.

e. **Marchant Deci-Magic,** depress decimal 4. (The bottom row of keys are decimal keys.)

3. SOLVE PROBLEM 1.

Semi-Automatic Multiplication

a. Depress the keys for the multiplicand, 25.5625, so that the whole number, 25, will be to the left of the fixed decimal point. The 2 will be in row six and the 5 will be in row five of the keyboard. The decimals, .5625, will be in rows four, three, two, and one.

Multiply Over Fixed Decimal Points:

1	25.5625	×	3.875	_____	1 _____
2	61.625	×	12.75	_____	2 _____
3	6.0625	×	4.125	_____	3 _____
4	9.25	×	8.5	_____	4 _____
5	8.9375	×	1.3333	_____	5 _____
6	75.125	×	7.375	_____	6 _____
7	21.3591	×	4.7032	_____	7 _____
8	45.168	×	3.645	_____	8 _____
9	93.3892	×	52.681	_____	9 _____
10	32.753	×	6.493	_____	10 _____

ANSWERS

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JOB NO. 44 / CONTINUED

Use a fixed decimal to extend the items on this bill. Change fractions to decimals.

Tel. 212-714-8675

SMITH and ADAMS
Textile Wholesalers
1741 Broadway
New York, New York 10014

Invoice #14

J. White & Sons
146 Main Street
Newark, New Jersey 07112

Date 6/27/19__
Terms 2/10 N/30
Via Express

Color	Material	Yards	Price	Amount
117	Gingham	25 1/4	1.192	1.
125		22 1/2	.983	2.
136		18 1/4	.758	3.
101		20 3/4	1.215	4.
117	Organdy	40 1/2	1.792	5.
125		39 1/4	1.694	6.
136		41 3/4	1.982	7.
102		38 1/8	1.253	8.
107	Orlon	21 1/4	2.984	9.
127		20 3/4	1.673	10.
116		17 1/2	2.256	11.
120		20 1/8	1.983	12.
121	Dacron	11 1/2	2.892	13.
122		18 3/4	3.923	14.
	Total			15.

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

44 MULTIPLICATION OVER FIXED DECIMAL POINTS

b. Repeat-add by the multiplier, 3.875. Move the carriage one place to the right because the multiplier contains only three decimals, which is one less than the maximum of four preset in the counter dials.

In Problem 2, you will move the carriage two places because the multiplier contains only two decimals — two less than the maximum of four.

(1) **Friden** and **Monroe.** Depress plus (+) bar: five times — shift carriage to right; seven times — shift carriage to right; eight times — shift carriage to right; three times.

(2) **Marchant.** Depress (×) bar; five times — shift carriage to right; seven times — shift carriage to right; eight times — shift carriage to right; three times.

c. The multiplier, 3.875, will appear in the fifth, fourth, third, and second counter dials. The answer, 99.05468750, will appear in the register dials. Record the answer as 99.05. (If the third decimal in the answer is 5 or more, add 1 to the second decimal; if 4 or less, drop it.)

Fully Automatic Calculators

a. **Friden**

(1) Enter multiplicand, 25.5625, on the keyboard beginning with row 6.

(2) On the small keyboard at the left of the machine, depress 3, 8, 7, 5, and 0. (Zero is depressed because there are only 3 decimals, one less than the maximum of four. In Problem 2, you will have to depress the zero key twice.)

(3) Depress the (MULT) key. The answer, 99.05468750, should be recorded as 99.05.

44 MULTIPLICATION OVER FIXED DECIMAL POINTS

b. **Marchant Fully Automatic**
(1) Move carriage directional control, which is above the multiplier keys, to the **left.**
(2) Enter multiplicand, 25.5625, on the keyboard beginning with row 6.
(3) Depress tab key 6, located at bottom of keyboard or between carriage dials. This presets machine to multiply by two whole numbers.
(4) Depress the (TAB) or carriage return bar.
(5) Because the multiplier, 3.875, has only one whole number, depress the 0 multiplier key. If the multiplier had three whole numbers, you would depress the right carriage shift key (→).
(6) Depress the 3, 8, 7, and 5 multiplier key.
(7) Depress the (TAB) bar and three clear bars to preset calculator for the next problem.

c. **Marchant Deci-Magic**
(1) Depress decimal key 4, located below the keyboard.
(2) Enter multiplicand, 25.5625, beginning with row six. Depress (×) key.
(3) Enter multiplier, 3.875, beginning with keyboard row five. Depress (POS=) key.
(4) Record answer, 99.05468750, as 99.05.

d. **Monroe**
(1) Enter 25.5625, beginning with keyboard row six. Depress (SET-UP) or (ENTER MULTIPLIER) key.
(2) Enter multiplier, 3.875, beginning with keyboard row five.
(3) Depress (CLEAR MULT) key.
(4) The answer, 99.05468750, should be recorded as 99.05.

JOB NO. 44 / CONTINUED Name_____ Period_____

Change fractions to decimals. Use a fixed decimal point to compute the extensions.

INVENTORY SHEET NO. 312

Dept. Piece Goods Date June 30, 19__

Material	Bolt No.	Yards	Price	AMOUNT
Corduroy	117	39 1/2	1.675	1.
	118	36 1/4	1.753	2.
	119	40 1/8	1.984	3.
	120	37 3/4	1.167	4.
Muslin	49	30 1/4	.687	5.
	50	32 1/8	.715	6.
	51	29 3/4	.836	7.
	52	28 1/2	.752	8.
Cotton	71	20	.551	9.
	72	23 1/8	.516	10.
	73	19 1/4	.572	11.
	74	18 3/4	.581	12.
	75	21 1/2	.655	13.
Linen	204	25 3/4	2.883	14.
	205	28 1/4	2.975	15.
Wool Crepe	216	18 1/2	6.952	16.
	217	17 1/4	6.651	17.
	218	21 3/4	5.954	18.
	17	14 1/2	3.885	19.
Total				20.

Taken by_____ Extended by_____

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ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____

JOB NO. 44 / CONTINUED

TIMED DRILL

Instructions:

1. Where necessary, change fractions to decimals and multiply over the FIXED DECIMAL POINTS.
2. Record answers to the nearest cent.

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

1	87.5	yds.	@	2.075	181.56	13	35 1/2	yds.	@	1.125	39.94
2	39.25	yds.	@	.582	22.84	14	28 1/8	yds.	@	1.75	49.22
3	67.125	yds.	@	4.587	307.90	15	7 1/4	yds.	@	2.666	19.33
4	4.333	yds.	@	.935	4.05	16	4 3/4	yds.	@	2.25	10.69
5	49.75	yds.	@	1.025	50.99	17	16 1/2	yds.	@	1.333	21.99
6	25.666	yds.	@	.875	22.46	18	4 1/4	yds.	@	2.125	9.03
7	91.5	yds.	@	5.562	508.92	19	23 1/8	yds.	@	1.75	40.47
8	47.5	yds.	@	1.916	91.01	20	14 1/2	yds.	@	4.916	71.28
9	49.437	yds.	@	.49	24.22	21	81 1/4	yds.	@	1.125	91.41
10	99.5	yds.	@	1.295	128.85	22	7 3/4	yds.	@	.937	7.26
11	34.125	yds.	@	2.187	74.63	23	19 1/2	yds.	@	.125	2.44
12	47.25	yds.	@	.625	29.53	24	17 1/4	yds.	@	3.687	63.60

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44 MULTIPLICATION OVER FIXED DECIMAL POINTS

4. COMPLETE SMITH AND ADAMS INVOICE.

a. Change the fractions to decimals as follows:
½ = .5 ¼ = .25 ¾ = .75 ⅛ = .125

b. Use fixed decimal points to compute the extensions.

c. Record answers to nearest cent.

5. COMPLETE INVENTORY SHEET NO. 312.

a. Change fractions to decimals as you did for the Smith and Adams invoice.

6. COMPLETE THE TIMED DRILL as usual, and use Grading Scale No. 4 on page 187 to determine your grade.

a. If you have time, do the Timed Drill again. Try to improve your speed. Record your best grade on the Achievement Chart on page 188.

b. Record answers to nearest cent.

7. GIVE JOB TO INSTRUCTOR when completed.

45 DIVISION OVER FIXED DECIMAL POINTS

JOB NO. 45
DIVISION OVER FIXED DECIMAL POINTS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To introduce the division (÷) and (ENTER DIV.) keys for division on rotary calculators.
2. To present the use of fixed decimal points in determining decimal points in answers.

PROCEDURE

1. CLEAR MACHINE. Prepare calculator for division, and set decimal markers at:
   a. Keyboard, between rows 4 and 3.
   b. Counter dials, between 4 and 3.
   c. Register dials, between 7 and 6.

2. SOLVE PROBLEM 1.

Semi-Automatic Calculators

   a. Enter dividend, 8,761.25, around the keyboard fixed decimal point.
      (1) Keep whole numbers to left of decimal point by beginning at keyboard row 7.
      (2) Because there are only two decimals in the dividend, no keys will be depressed in keyboard row one.
      (3) No keys will be depressed in keyboard rows 1, 2, and 3 at right of fixed decimal point for dividends without decimals.
   b. Move the carriage so that the decimal marker on the register dials is directly above the decimal marker on the keyboard.
   c. Depress the plus (+) bar.
   d. Clear the figure 1 out of the counter dials, if necessary.
   e. Engage the repeat key. On **Friden,** move the (ADD) key **down.**
   f. Enter the divisor, 375.25, around the keyboard fixed decimal point.

Divide over fixed decimals. Round off answer to two decimals.

1	8,761.25	÷	375.25	_____
2	3,788.5	÷	23.5	_____
3	455.125	÷	29.75	_____
4	4,467.2	÷	3.22	_____
5	54.125	÷	.067	_____
6	5,679.	÷	176.	_____
7	3,938.	÷	276.253	_____
8	978.24	÷	384.	_____
9	146.75	÷	.035	_____
10	260.667	÷	9.125	_____

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____

JOB NO. 45 / CONTINUED

Divide:

1. Set fixed decimals of 3-3-6.
2. Change fractions to their decimal equivalents as follows:
   ½ = .5 ¼ = .25 ¾ = .75 ⅛ = .125
3. Round off answers to two places.

					ANSWERS
11	3,288	÷	112 1/2	_____	11 _____
12	856	÷	35 3/4	_____	12 _____
13	1,440	÷	60 1/4	_____	13 _____
14	1,920	÷	128 1/8	_____	14 _____
15	924	÷	42 1/2	_____	15 _____
16	882	÷	49 1/4	_____	16 _____
17	868	÷	31 1/8	_____	17 _____
18	8,680	÷	35 1/2	_____	18 _____
19	544	÷	16 3/4	_____	19 _____
20	1,056	÷	48 1/8	_____	20 _____

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45 DIVISION OVER FIXED DECIMAL POINTS

(1) Keep whole numbers to left of keyboard fixed decimal point by beginning with row 6.
(2) Because there are only two decimals in the divisor, no keys will be depressed in keyboard row one.
(3) No keys will be depressed in keyboard rows 3, 2, and 1 to the right of fixed decimal point for divisors without decimals.

g. Shift (➔) the carriage one place to the right, so that the 8 in 8761.25 in the register dials is directly above the 3 in 375.25 on the keyboard.
h. Depress the division (÷) key — on the **Friden**, both division keys; on **Monroe Educator**, move lever **up** to ÷ position.
i. The answer, 23.347, will appear in the counter dials. Round it off to two places, and record the answer as 23.35.
j. Clear the calculator, and follow the same procedure to complete the remaining problems.

Fully Automatic Calculators

a. **Friden:**
(1) Clear calculator, and move (ADD) key **down**.
(2) Depress tab key 3.
(3) Enter dividend 8,761.25, around fixed decimal point on the keyboard.
(4) Depress (ENTER DIVD) key.
(5) Enter divisor, 375.25, around fixed decimal point on the keyboard.
(6) Depress both division (÷) keys.
(7) The answer, 23.347, will appear in the counter dials. Record it as 23.35.

45 DIVISION OVER FIXED DECIMAL POINTS

b. **Marchant:**

(1) Clear calculator, and depress tab key 4 (one more than the number of decimals desired in the answer).
(2) Move the carriage directional control so the carriage moves to the left.
(3) Depress (TAB) or (CARRIAGE RETURN) bar for the first problem **only**.
(4) Enter dividend, 8,761.25, around fixed decimal point on the keyboard, and depress (ENTER DIVD) key or (+Dividend).
(5) Enter the divisor, 375.25, around the fixed decimal point on the keyboard.
(6) Depress both the (LINE-UP) and/or the division (÷) keys.
(7) The answer, 23.347, will appear in the counter dials. Record it as 23.35.

c. **Marchant Deci-Magic:**

(1) Clear calculator, and depress decimal key 3.
(2) Enter dividend, 8,761.25, around keyboard fixed decimal point, and depress (ENTER DIVD) key.
(3) Enter divisor, 375.25, around the keyboard fixed decimal.
(4) Depress both the (LINE-UP) and the division (÷) keys.
(5) The answer, 23.347, will appear in the counter dials. Record it as 23.35.

d. **Monroe:**

(1) Clear calculator, and depress tab key 4 (one more than the number of decimals desired in the answer).
(2) Enter the dividend, 8,761.25, around the fixed decimal point on the keyboard.

JOB NO. 45 / CONTINUED Name_____ Period_____

Find average inventory:

1. Add four inventories horizontally, and record total in the "Yearly Total" column.
2. Divide yearly total by 4.
3. Round off the answer to two places, and record it in the "Average Inventory" column.

A-1 DEPARTMENT STORES
Average Inventory Computations
For Year Ended December 31, 19__

Dept. No.	Book Inventory for: Jan. 2	Apr. 1	July 1	Oct. 1	Yearly Total	Average Inventory
100	1,245.12	945.68	1,115.67	846.75	4,153.22	1,038.31
101	987.65	1,567.43	867.42	1,247.81	_____	(21) _____
102	2,269.73	1,145.67	1,894.57	641.89	_____	(22) _____
103	1,567.92	3,457.61	895.61	1,345.63	_____	(23) _____
104	2,863.42	1,762.47	2,489.13	2,178.46	_____	(24) _____
105	1,489.12	2,675.41	2,561.15	3,478.12	_____	(25) _____
106	845.76	1,286.36	945.63	1,546.78	_____	(26) _____
107	2,561.35	678.95	2,569.12	2,785.06	_____	(27) _____
108	1,436.87	1,184.61	1,486.32	1,286.76	_____	(28) _____
109	855.23	946.83	761.02	1,021.03	_____	(29) _____
110	2,011.15	1,679.32	986.13	861.75	_____	(30) _____

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JOB NO. 45 / CONTINUED

TIMED DRILL

Instructions:

1. Set decimal markers of 3, 3, and 6.
2. Divide the Amount of Sales by the Number of Customers.
3. Round out the answers to the nearest cent.

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock
minutes

Subtract _____ required

DEPARTMENT STORE SALES ANALYSIS

Dept. No.	Amount Of Sales	Number of Customers	Average Per Customer	Dept. No.	Amount Of Sales	Number of Customers	Average Per Customer
A-1	8,623.74	920	9.37	D-1	4,456.62	133	33.51
A-2	17,620.93	345	51.08	D-2	1,975.30	159	12.42
A-3	89,842.65	587	153.05	D-3	1,727.13	694	2.49
A-4	4,368.69	1,769	2.47	D-4	18,689.70	104	179.71
B-2	17,579.64	2,112	8.32	D-5	12,761.55	450	28.36
B-3	8,496.71	39	217.86	D-6	12,716.46	157	81.00
B-4	4,392.70	734	5.98	E-1	18,662.42	102	182.96
B-5	9,658.21	1,563	6.18	E-2	18,467.83	205	90.09
C-1	5,291.16	435	12.16	E-3	12,483.30	389	32.09
C-2	6,789.42	673	10.09	F-1	9,789.50	1,567	6.25
C-3	7,432.36	360	20.65	F-2	8,542.76	2,001	4.27
C-4	2,293.50	162	14.16	F-3	9,147.23	3,112	2.94

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45 DIVISION OVER FIXED DECIMAL POINTS

(3) Depress (ENTER DIVD) key.
(4) Enter divisor, 375.25, around the fixed decimal point on the keyboard.
(5) Shift the carriage so that the 8 of **8**,761.25 in the register dials is directly above the 3 of the divisor on the keyboard or move the (DIVD ALIGN) lever **up**. Depress the (DIV) key.
(6) The answer, 23.347, will appear in the counter dials. Record it as 23.35.

3. COMPLETE REMAINING PROBLEMS, following the same procedure.

4. COMPLETE THE TIMED DRILL as usual, and use Grading Scale No. 4 on page 187 to determine your grade.
a. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.

5. GIVE JOB TO INSTRUCTOR when completed.

NOTE: Before proceeding to Job No. 46, ask your instructor about Test No. 9. He may want you to complete it before you start Job No. 46.

46 CONSTANTS IN ADDITION, SUBTRACTION, AND MULTIPLICATION

JOB NO. 46 CONSTANTS IN ADDITION, SUBTRACTION, AND MULTIPLICATION

Name _____ Period _____ Date _____

No. of Errors _____ Rating _____

AIM:

To present ways of keeping a constant in the calculator until an entire series of problems is completed. (A constant is a number that reoccurs in a series of problems.)

PROCEDURE

ADDING CONSTANTS

1. **CLEAR MACHINE.** Prepare calculator for addition. Place a decimal marker between the third and second register dials.
2. **ENTER CONSTANT.** Depress the keys for the constant, 4.85, and add it.
3. **ENTER VARIABLE.** Depress the keys for the variable, 12.75.
   a. **Friden** — Move (ADD) key **up** and depress the plus (+) bar.
   b. **Marchant Semi-Automatic** — Depress multiplication (×) bar lightly.
   c. **Marchant Fully Automatic** — Move carriage direction control to left, and depress "1" multiplier key.
   d. **Marchant Deci-Magic** — Depress (KB LOCK) key and plus (+) bar.
   e. **Monroe** —Depress the repeat (R) key or move lever to (R). Depress plus (+) bar.
4. **RECORD ANSWER.** The answer, 17.60, will appear in the register dials; 2 will appear in the counter dials. Write the answer in the space provided. The keys for the variable, 12.75, should still be depressed on the keyboard.
5. **DEPRESS MINUS (—) BAR.**
6. **CLEAR KEYBOARD** on the **Friden, Marchant Deci-Magic**, and **Monroe**. Do **not** clear any other dials. The constant, 4.85, should remain in the register dials.
7. **COMPLETE PROBLEMS.** Repeat Steps 3 through 6 for each of the remaining problems in the series.
8. **OBTAIN TOTAL** by adding the answers in the "Full Am't." column.

(137)

1

Am't. of Invoice		Fixed Charge	Full Am't.
12.75	+	4.85	
125.00	+	4.85	
26.75	+	4.85	
185.20	+	4.85	
395.10	+	4.85	
		Total	

2

Am't. of Invoice		Fixed Charge	Full Am't.
9,099	+	1,025	
3,440	+	1,025	
7,220	+	1,025	
5,606	+	1,025	
6,780	+	1,025	
		Total	

3

275.33	+	9.63	
350.15	+	9.63	
147.61	+	9.63	
185.93	+	9.63	
246.25	+	9.63	
		Total	

4

18,660	+	1,500	
9,675	+	1,500	
12,660	+	1,500	
15,660	+	1,500	
7,125	+	1,500	
		Total	

5

178.40	+	7.25	
685.10	+	7.25	
545.23	+	7.25	
256.18	+	7.25	
570.21	+	7.25	
		Total	

6

34,520	+	1,950	
38,145	+	1,950	
23,725	+	1,950	
32,000	+	1,950	
94,360	+	1,950	
		Total	

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

= 137

(137)

JOB NO. 46 / CONTINUED

7

Gross Weight		Tare	Net Weight
17,550	—	1,500	
25,812	—	1,500	
14,341	—	1,500	
12,784	—	1,500	
11,341	—	1,500	
		Total	

8

Gross Weight		Tare	Net Weight
45,143	—	9,400	
27,415	—	9,400	
59,484	—	9,400	
83,174	—	9,400	
43,245	—	9,400	
		Total	

9

13,465	—	1,700	
17,281	—	1,700	
21,973	—	1,700	
45,140	—	1,700	
20,876	—	1,700	
		Total	

10

32,855	—	7,225	
53,946	—	7,225	
43,075	—	7,225	
22,418	—	7,225	
61,240	—	7,225	
		Total	

11

65,143	—	2,400	
43,245	—	2,400	
12,789	—	2,400	
32,485	—	2,400	
11,327	—	2,400	
		Total	

12

42,645	—	8,200	
85,461	—	8,200	
32,655	—	8,200	
22,723	—	8,200	
13,824	—	8,200	
		Total	

ANSWERS

7 _____

8 _____

9 _____

10 _____

11 _____

12 _____

E= 138

46 CONSTANTS IN ADDITION, SUBTRACTION, AND MULTIPLICATION

SUBTRACTING CONSTANTS

1. **CLEAR MACHINE.** Prepare calculator for subtraction.
2. **ENTER CONSTANT.** Depress the keys for the constant in Problem 7, 1,500, and subtract it from zero. The register dials will show 999,998,500. (The number of 9's will depend upon the size of your carriage.)
3. **ENTER VARIABLE.** Depress the keys for the variable, 17,550, and on the:
   a. **Friden**, move (ADD) key **up** and depress the plus (+) bar.
   b. **Marchant Semi-Automatic**, depress the (x) bar.
   c. **Marchant Fully Automatic**, move carriage direction control to left, and depress "1" multiplier key.
   d. **Marchant Deci-Magic**, depress (KB LOCK) key and the plus (+) bar.
   e. **Monroe**, depress repeat (R) key or move lever to (R) and depress plus (+) bar.
4. **RECORD ANSWER.** The answer, 16,050, will appear in the register dials; "0" will appear in the counter dials. Write the answer in the space provided.
5. **DEPRESS MINUS (—) BAR.**
6. **CLEAR KEYBOARD** on the **Friden, Marchant Deci-Magic**, and **Monroe**. Do **not** clear other dials. The constant, 999,998,500, should remain in the register dials.
7. **COMPLETE PROBLEMS.** Repeat 3 through 6 for each of the remaining problems in this series. To get the total, add answers in the "Net Weight" column.
8. **CLEAR ALL DIALS** and the keyboard before beginning Problem 8.

46 CONSTANTS IN ADDITION, SUBTRACTION, AND MULTIPLICATION

MULTIPLYING WITH CONSTANTS

1. **CLEAR MACHINE.** Prepare calculator for multiplication, and place a decimal marker between the third and second register dials.
2. **SOLVE PROBLEMS 13-32** by following these instructions for Series One:

Semi-Automatic Calculators

a. Enter the constant (the number that appears in each problem of the series), 1.45, on the keyboard.
b. Lock it on the keyboard. **Friden** — Move the (ADD) key up. **Marchant** — Depress (×) bar to increase and (SHORT CUT) bar to decrease multiplier figures. **Monroe** —Engage the repeat key.
c. Multiply by the first multiplier, 37.
d. Record the answer, 53.65, but **do not** clear the keyboard or any dials.
e. Change the figures in counter dials from 37 to the second multiplier, 42. This is done by adding or subtracting as necessary.
f. Change first figure 3 to 4 by depressing (+) bar or (×) bar once. Change 7 to 2 by depressing the (—) bar or (SHORT CUT) bar five times.
g. Record the answer, 60.90, but do not clear the keyboard or any dials.
h. Follow this procedure for the remaining multipliers. Clear machine at the end of series.

Fully Automatic Calculators

a. **Friden**
   (1) Enter constant, 1.45, on keyboard.
   (2) Push (KB LOCK) lever, located at upper right of keyboard, **down.**
   (3) Enter 37 in small multiplier keyboard and depress (MULT) key. Record the answer, 53.65.
   (4) Follow this procedure for the remaining multipliers. Before entering the last multiplier, raise the (KB LOCK) lever.

JOB NO. 46 / CONTINUED Name_____ Period_____

Series One

	Hours		Rate	Amount
13	37	@	1.45	
14	42	@	1.45	
15	36	@	1.45	
16	39	@	1.45	
17	52	@	1.45	

Series Two

	Hours		Rate	Amount
18	26	@	2.52	
19	35	@	2.52	
20	27	@	2.52	
21	36	@	2.52	
22	42	@	2.52	

Series Three

	Bd. Ft.		Rate	Amount
23	636	@	.45	
24	514	@	.45	
25	791	@	.45	
26	658	@	.45	
27	339	@	.45	

Series Four

	Units		Rate	Amount
28	456	@	2.15	
29	183	@	2.15	
30	122	@	2.15	
31	555	@	2.15	
32	267	@	2.15	

ANSWERS

13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____
31 _____
32 _____

139

JOB NO. 46 / CONTINUED

TIMED DRILL

Instructions:

1. Do the Timed Drill as usual, and use Grading Scale No. 4 on page 187 to determine your grade.
2. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.

Complete the following payroll computations: (no overtime pay)

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

Employee Number	Hours	Rate	Amount	Employee Number	Hours	Rate	Amount
126	40	4.25	170.00	141	38	5.85	222.30
127	24	4.25	102.00	142	45	5.85	263.25
128	38	4.25	161.50	143	47	5.85	274.95
129	45	4.25	191.25	144	49	5.85	286.65
130	48	4.25	204.00	145	51	5.85	298.35
131	34	4.10	139.40	146	40	5.80	232.00
132	38	4.10	155.80	147	36	5.80	208.80
133	44	4.10	180.40	148	47	5.80	272.60
134	40	4.10	164.00	149	48	5.80	278.40
135	45	4.10	184.50	150	44	5.80	255.20
136	50	5.35	267.50	151	40	4.75	190.00
137	41	5.35	219.35	152	41	4.75	194.75
138	38	5.35	203.30	153	42	4.75	199.50
139	40	5.35	214.00	154	48	4.75	228.00
140	45	5.35	240.75	155	51	4.75	242.25

E= 140

E= 14

46 CONSTANTS IN ADDITION, SUBTRACTION, AND MULTIPLICATION

b. **Marchant Fully Automatic**
   (1) Enter constant, 1.45, on keyboard.
   (2) Set carriage direction control, to **right.**
   (3) Multiply by the first multiplier of the series, 37. (Depress 7, then 3.)
   (4) Record the answer, 53.65, and clear the middle and upper dials. Return the carriage, but **do not clear** the keyboard.
   (5) Multiply by the remaining multipliers.

c. **Marchant Deci-Magic**
   (1) Enter constant, 1.45, and depress (×) bar.
   (2) Depress the (FRONT DIAL LOCK), located to the right of (×) bar.
   (3) Enter the first multiplier, 37, and depress the (POS =) key. Record answer, 53.65.
   (4) Enter the second multiplier, 42, and depress the (×) bar, then the (POS =) key. Record answer, 60.90.
   (5) Follow the procedure outlined in Step (4) for the remaining multipliers.
   (6) Depress the (FRONT DIAL CLEAR) key, located at the lower right of the keyboard, to clear the constant dials.

d. **Monroe**
   (1) Enter constant, 1.45, and depress (SET UP) or (ENTER MULTIPLIER) key.
   (2) Move constant multiplier lever down to the (C) position.
   (3) Enter first multiplier, 37, and depress the (CLEAR MULT) key. Record answer, 53.65.
   (4) Use the procedure in Step (3) for the remaining multipliers except the last one.
   (5) Move constant multiplier lever up, before entering the last multiplier.

COMPLETE THE TIMED DRILL, and give the completed job to your instructor.

47 CASH, TRADE, AND CHAIN DISCOUNTS

JOB NO. 47
CASH, TRADE, AND
CHAIN DISCOUNTS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present the procedures followed in computing trade, cash, and chain discounts.

PROCEDURE

METHOD I (PROBLEMS 1-15)

1. **CLEAR MACHINE** and prepare it for multiplication. On **Marchant**, depress tab key 2, and set direction control lever for left to right multiplication — move to left.
2. **SET DECIMAL MARKERS** at:
   a. Keyboard, between rows 3 and 2.
   b. Counter dials, between 3 and 2.
   c. Register dials, between 5 and 4.
   d. **Friden** multiplier keyboard, over 2.
   e. **Marchant Deci-Magic,** decimal key 2.
3. **CONVERT PERCENTAGE.** Change the percentage of discount to its decimal equivalent. In Problem 1, the discount of 25% equals .25. Multiply 583.45 by .25. In Problem 2, the discount of 5% equals .05. Multiply 235.68 by .05.
4. **ENTER GROSS AMOUNT,** 583.45, around keyboard fixed decimal point. Start multiplication procedure as described in Job No. 44.
5. **ENTER DISCOUNT,** as a decimal (.25), around the fixed decimal point. Multiply as described in Job No. 44.
6. **RECORD DISCOUNT.** The discount, 145.8625 will appear in the register dials. Record it as 145.86.
7. **SUBTRACT DISCOUNT,** 145.86, from the gross amount, 583.45, and record the answer, 437.59, in the spaces provided.

Use Method I to find the amount of the **discount** and the **Net Amount**. Change the discount percent to decimals as follows: 25% to .25, and 5% to .05. Multiply over fixed decimals of 2, 2, and 4.

				Discount	Net Amount
1	583.45	less	25%		
2	235.68	less	5%		
3	475.25	less	10%		
4	970.85	less	12%		
5	55.50	less	20%		
6	425.75	less	5%		
7	103.50	less	18%		
8	575.00	less	20%		
9	295.40	less	15%		
10	462.84	less	12%		
11	78.49	less	30%		
12	162.22	less	7%		
13	461.73	less	20%		
14	783.92	less	25%		
15	425.80	less	16%		

ANSWERS
Net Amount

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____

141

JOB NO. 47 / CONTINUED

Instructions:

Use Method II to find the **net amount**. Find net amount percent: 100% less 15% = 85% or .85. Multiply 125.75 by .85 over fixed decimal points of 2-2-4. Round off answer to two decimal places.

	Gross Amount		Discount	Net Amount
16	125.75	less	15%	
17	148.32	less	12%	
18	365.00	less	5%	
19	446.75	less	25%	
20	134.47	less	20%	
21	357.50	less	30%	
22	96.78	less	10%	
23	437.63	less	15%	
24	102.47	less	8%	
25	98.95	less	12%	
26	735.50	less	25%	
27	69.87	less	5%	
28	410.15	less	15%	
29	525.30	less	8%	
30	175.80	less	12%	

ANSWERS

16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____

142

METHOD II (PROBLEMS 16-30)

This method is used when **only** the net amount is required.

1. **CLEAR MACHINE** and prepare it for multiplication. On **Marchant**, depress tab key 2, and set direction control lever for left to right multiplication — move to left.
2. **SET DECIMAL MARKERS** at:
   a. Keyboard, between rows 3 and 2.
   b. Counter dials, between 3 and 2.
   c. Register dials, between 5 and 4.
   d. **Friden** multiplier keyboard, over 2.
   e. **Marchant Deci-Magic**, depress decimal key 2.
3. **SUBTRACT DISCOUNT,** mentally; 15% from 100% is the net amount in percent — 85%.
4. **CONVERT PERCENTAGE.** Change 85% to decimals — .85.
5. **ENTER GROSS AMOUNT,** 125.75, around keyboard fixed decimal point. Start the multiplication procedure as described in Job No. 44.
6. **ENTER NET AMOUNT** percent, .85, and multiply as usual. If necessary, refer to Job No. 44.
7. **RECORD NET AMOUNT.** The net amount, 106.8875, will appear in the register dials. Record it as 106.89 in the spaces provided.
8. **COMPLETE REMAINING PROBLEMS** following the same procedure.

47 CASH, TRADE, AND CHAIN DISCOUNTS

CHAIN DISCOUNTS (PROBLEMS 31-35)

1. **CLEAR MACHINE.** Prepare calculator. On **Marchant Fully Automatic,** depress tab key 4, to position the carriage.
2. **SET DECIMAL MARKERS** at:
   a. Keyboard, between rows 5 and 4.
   b. Counter dials, between 5 and 4.
   c. Register dials, between 9 and 8.
   d. **Friden** multiplier keyboard, over 4.
3. **ENTER AMOUNT,** 370.15, around keyboard fixed decimal.
4. **MENTALLY DEDUCT FIRST DISCOUNT,** 15% from 100% to get the percent equivalent of the net amount — 85%. Convert to .85.
5. **MULTIPLY** by .85 over fixed decimal. The register dials will show 314.62750000, and the counter dials will show .8500.
6. **CLEAR KEYBOARD,** and enter first net amount, 314.6275, around keyboard fixed decimal.
7. **CLEAR REGISTER** and counter dials, depress tab key, and multiply by the second net amount percent equivalent, .90 (100% — 10% = 90% or .90). Register dials will show 283.16475000; counter dials, .9000.
8. **CLEAR KEYBOARD,** and enter second net amount, 283.1648, over keyboard fixed decimal.
9. **CLEAR REGISTER** and counter dials, depress tab key, and multiply by third percent equivalent of net amount, 100% less 5% equals .95. The register dials will show the answer, 269.00656000.
10. **ROUND OFF ANSWER,** 269.00656, to two decimals, and record it as 269.01 in the spaces provided.
11. **COMPLETE PROBLEMS** 32 through 35 in the above manner.

JOB NO. 47 / CONTINUED Name_____ Period_____

TABLE OF CHAIN DISCOUNT EQUIVALENTS

Rate	5	10	15	20	25
Net	.95	.90	.85	.80	.75
2 1/2	.92625	.8775	.83875	.78	.73125
5	.9025	.855	.8075	.76	.7125
5-2 1/2	.87994	.83363	.78731	.741	.69469
5-5	.85738	.81225	.76713	.722	.67688
5-5-2 1/2	.83594	.79194	.74795	.70395	.65995
7 1/2	.87875	.8325	.78625	.74	.69375
7 1/2-2 1/2	.85678	.81169	.76659	.7215	.67641
7 1/2-5	.83481	.79088	.74694	.703	.65906
10	.855	.81	.765	.72	.675
10-2 1/2	.83363	.78975	.74588	.702	.65813
10-5	.81225	.7695	.72675	.684	.64125
10-5-2 1/2	.79194	.75026	.70858	.6669	.63522
10-7 1/2	.79088	.74925	.70763	.666	.62438
10-10	.7695	.729	.6885	.648	.6075
10-10-5	.73103	.69255	.65408	.6456	.57713

ANSWERS

31 _____
32 _____
33 _____
34 _____
35 _____
36 _____
37 _____
38 _____
39 _____
40 _____

	Amount	Discounts	Net Amount
31	370.15	15-10-5	
32	163.40	15-5	
33	575.00	20-10-10	
34	128.79	5-2½	
35	313.44	25-7½-2½	

	Amount	Discounts	Net Amount
36	43.25	15-10-5	
37	65.00	25-2½	
38	46.75	20-10-5	
39	38.47	10-7½-2½	
40	97.24	10-10	

143

JOB NO. 47 / CONTINUED

TIMED DRILL

Instructions:

1. Use Method II to find the net amount.
2. Do the Timed Drill as usual, and use Grading Scale No. 4 on page 187 to deter mine your grade.
3. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

Add:

①	②	③
25.51	29.88	45.90
14.40	55.45	89.30
15.94	62.55	96.00
23.01	16.84	60.75
32.02	21.16	34.28
45.62	47.91	94.83
54.07	78.61	93.07
210.57	312.40	514.13

Subtract:

④	⑤
394.02	850.25
−147.31	−289.90
246.71	560.35

⑥	⑦
770.10	619.53
−198.50	−482.10
571.60	137.43

Find the **net amount** — Use Method II:

⑧	88.72	less	15%	75.41	⑫	14.30	less 18% 11.73
⑨	24.16	less	10%	21.74	⑬	13.47	less 13% 11.72
⑩	87.89	less	12%	77.34	⑭	19.43	less 15% 16.52
⑪	61.48	less	25%	46.11	⑮	20.78	less 5% 19.74

= 144

47 CASH, TRADE, AND CHAIN DISCOUNTS

PROBLEMS (36-40)

1. **CLEAR MACHINE;** On **Marchant Fully Automatic,** depress tab key 5 to position the carriage.
2. **SET DECIMAL MARKERS:**
   a. Keyboard, between rows 6 and 5.
   b. Counter dials, between 6 and 5.
   c. Register dials, between 11 and 10.
   d. **Friden** multiplier keyboard, over 5.
   e. **Marchant Deci-Magic,** depress decimal 5.
3. **FIND EQUIVALENT.** In the column headed 15 on the Table of Chain Discount Equivalents (page 143), find the equivalent opposite 10 — 5 in the left-hand column. This is .72675 — decimal equivalent of the net amount.
4. **ENTER AMOUNT,** 43.25, around keyboard fixed decimal.
5. **MULTIPLY** over the fixed decimal by .72675, the decimal equivalent of the net amount.
6. **ROUND OFF ANSWER.** The answer, 31.4319375, should be rounded off to two decimals, and recorded as 31.43 in the spaces provided.
7. **COMPLETE PROBLEMS** 36 through 40 in the above manner.

COMPLETE THE TIMED DRILL, and give the completed job to your instructor.

48 PERCENTAGE — INCREASE AND DECREASE

JOB NO. 48 PERCENTAGE — INCREASE AND DECREASE

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present the procedures followed in determining percentage of increase or decrease.

PROCEDURE

1. **CLEAR MACHINE** and set up decimal markers:
   a. Keyboard, between rows 5 and 4.
   b. Register dials, between 9 and 8.
   c. Counter dials, between 5 and 4.
   d. **Friden** multiplier keyboard, over 4.
   e. **Marchant Deci-Magic,** decimal key 4.

PROBLEMS 1-15

1. **CHANGE PERCENT TO A DECIMAL** by moving the decimal point two places to left and dropping the percent sign (%) as follows:

25%	to	.25
5%	to	.05
5¼%	to	.0425
¾%	to	.0075

   In Problem 1, 5% is changed to .05.
2. **MULTIPLY** 475.90 by .05 over fixed decimal points.
3. **USE ZERO MULTIPLIER KEY** or shift the carriage to the proper position to multiply by .05. If necessary, refer to Job No. 44 for detailed instructions for multiplying over fixed decimals.
4. **ROUND OFF ANSWER.** The answer, 23.79500000, will appear in the register dials. Round it off to 23.80, and record it in the spaces provided.

Find the interest for 1 year:

1. On $475.90 @ 5% _____
2. On $162.75 @ 4 1/2% _____
3. On $575.20 @ 1/4% _____
4. On $602.34 @ 3 1/4% _____
5. On $260.20 @ 2 3/4% _____

Find the dividend payable:

6. On $500.00 @ 3 1/2% _____
7. On $200.00 @ 6% _____
8. On $700.00 @ 7% _____
9. On $950.00 @ 8 1/5% _____
10. On $850.00 @ 3/4% _____

Find the commission earned on:

11. Sales of $3,156.12 @ 4 1/4% _____
12. Sales of $6,525.70 @ 5 1/2% _____
13. Sales of $2,189.38 @ 4 1/2% _____
14. Sales of $2,104.45 @ 3 3/4% _____
15. Sales of $8,196.40 @ 5 1/2% _____

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

JOB NO. 48 / CONTINUED

Find the percent of increase in sales. Carry the division to four decimal places. Round off the decimal to three places, and change it to a percent of increase.

	Dept.	Sales This Year	Last Year	Amount of Increase	Percent of Increase
16	A	2,389.12	2,135.15		
17	B	4,368.76	4,222.94		
18	C	5,655.57	5,460.15		
19	D	2,573.48	2,377.21		
20	E	3,162.85	2,982.65		
21	F	5,009.50	4,819.19		
22	G	2,443.93	2,140.39		
23	H	3,302.73	3,009.30		
24	I	1,790.58	1,522.45		
25	J	5,216.19	5,000.32		
26	K	2,121.85	1,987.73		
27	L	3,662.17	3,429.94		
28	M	3,302.08	3,051.65		
29	N	1,467.11	1,205.00		
30	O	3,196.49	2,852.23		

ANSWERS (% Only)

16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____

48 PERCENTAGE — INCREASE AND DECREASE

PROBLEMS 16-30

1. **CLEAR MACHINE,** and set up the same decimal markers used for Problems 1-15.
   a. **Friden Fully Automatic** — Depress tab key 4.
   b. **Marchant** and **Monroe Fully Automatic** — Depress tab key 5.
   c. **Marchant Deci-Magic** — Depress decimal key 4.
2. **SHIFT CARRIAGE** or tabulate so that the decimal marker on the register dials is over that of the keyboard.
3. **ENTER THIS YEAR'S SALES,** 2,389.12, and depress the plus (+) bar.
4. **ENTER LAST YEAR'S SALES,** 2,135.15, and on:
   a. **Friden,** move (ADD) key up and subtract.
   b. **Marchant Fully Automatic,** depress (NEG ×) and multiplier key 1.
   c. **Marchant Semi-Automatic,** depress (SHORT CUT) bar to subtract.
   d. **Marchant Deci-Magic,** depress (KB LOCK) key and minus (—) bar.
   e. **Monroe,** engage the repeat key, and subtract.
5. **RECORD ANSWER.** The amount of the increase, 253.97, will appear in the register dials. Record it in the space provided.
6. **RETAIN AND DIVIDE.** Keep 2,135.15 on the keyboard and divide.
   a. **Semi-Automatics** — Shift carriage so that the 2 of 253.97 in the register dials is over the 2 of **2**,135.15 on the keyboard and divide.
   b. **Friden** — Depress both division (÷) keys.
   c. **Marchant** — Depress (LINE-UP) and/or (÷) keys.
   d. **Monroe** — Move (DIVD ALIGN) lever **up**, or shift carriage manually, and depress the (÷) key.
7. **ROUND OFF ANSWER.** The answer, .1189, in the counter dials should be rounded off to three decimals, and recorded as 11.9%.

48 PERCENTAGE—INCREASE AND DECREASE

PROBLEMS 31-45

1. **CLEAR MACHINE.** Use the same decimal markers and tab stops that were set up for Problems 16-30.
2. **SHIFT CARRIAGE** or tabulate so that the decimal marker on the register dials is over that of the keyboard.
3. **ENTER THIS YEAR'S EXPENSES,** 1,458.10, and subtract. The complement of the number depressed on the keyboard, 8,541.90, will be preceded by 9's.
4. **ENTER LAST YEAR'S EXPENSES,** 1,579.75, and on:
   a. **Friden**, move (ADD) key **up** and add.
   b. **Marchant Semi-Automatic,** depress (×) key to add.
   c. **Marchant Fully Automatic,** depress multiplier key "1".
   d. **Marchant Deci-Magic**, depress (KB LOCK) key and plus (+) bar.
   e. **Monroe,** engage the repeat key, and add.
5. **RECORD ANSWER.** The amount of the decrease, 121.65, will appear in the register dials. Record it in the space provided.
6. **RETAIN AND DIVIDE.** The amount of Last Year's expenses, 1,579.75, should still be on the keyboard. Divide following the instructions listed above for percentage of increase.
7. **ROUND OFF ANSWER.** The answer, .0770, will appear in the counter dials. Round it off to three places, and record the percentage of decrease as 7.7%.

JOB NO. 48 / CONTINUED Name_____ Period_____

Find the percent of decrease in expenses. Carry the division to four decimal places. Round off the decimal to three places, and change it to a percent of decrease.

	Dept.	This Year	Last Year	Amount of Decrease	Percentage of Decrease		ANSWERS (% Only)
31	101	1,458.10	1,579.75			31	
32	102	6,321.15	6,850.93			32	
33	106	7,059.35	7,429.32			33	
34	201	4,933.28	5,360.68			34	
35	208	8,248.50	8,750.18			35	
36	209	5,932.75	6,175.47			36	
37	301	2,175.02	2,480.23			37	
38	302	3,241.46	3,425.81			38	
39	303	8,403.77	8,651.50			39	
40	304	6,478.12	6,783.18			40	
41	305	4,160.15	4,421.85			41	
42	308	3,001.19	3,280.49			42	
43	401	9,285.32	9,671.74			43	
44	402	5,842.95	6,113.50			44	
45	403	8,748.10	9,123.42			45	

147

JOB NO. 48 / CONTINUED

TIMED DRILL

Instructions:

1. Use fixed decimals of 4, 4, and 8.
2. Round off the answers to Problems 1 to 8 to the nearest cent.
3. Round off the answers to Problems 9 to 16 to three decimals.

Finished at _____ o'clock

Started at _____ o'clock

minutes

Subtract _____ required

Find the interest for 1 year on:

1	1,142.75	@ 5%	57.14
2	675.90	@ 4 1/4%	28.73
3	4,190.19	@ 3%	125.71
4	7,231.69	@ 4 3/4%	343.51

Find the commission earned on:

5	1,309.27	@ 2 3/4%	36.00
6	2,150.54	@ 4%	86.02
7	4,507.51	@ 1 3/4%	78.88
8	1,379.21	@ 8%	110.34

Find the percentage of increase:

	Current	Previous	Percent of Increase
9	2,506.35	2,463.29	1.7%
10	4,920.77	4,706.12	4.6%
11	2,326.63	2,190.34	6.2%
12	4,585.40	4,230.87	8.4%

Find the percentage of decrease:

	Current	Previous	Percent of Decrease
13	4,823.58	5,014.04	3.8%
14	2,519.02	2,750.45	8.4%
15	7,651.59	7,821.98	2.2%
16	1,276.05	1,540.66	17.2%

= 148

48 PERCENTAGE — INCREASE AND DECREASE

After all problems have been completed:

1. **COMPLETE THE TIMED DRILL** as usual, and use Grading Scale No. 4 on page 187 to determine your grade.
   a. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.
2. **GIVE JOB TO INSTRUCTOR** when completed.

ON THE JOB

Good posture fights fatigue.

Maintain good posture
while operating your machine.

49 ACCUMULATIVE MULTIPLICATION

JOB NO. 49
ACCUMULATIVE MULTIPLICATION

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present the method of setting the calculator to multiply several items of an invoice and to accumulate the products in the register dials so that they can be added in the same operation.

PROCEDURE

1. **CLEAR MACHINE,** and set decimal markers:
   a. Keyboard, between rows 4 and 3.
   b. Register dials, between 7 and 6.
   c. Counter dials, between 4 and 3.
   d. **Friden** multiplier keyboard, over 3.
   e. **Marchant Deci-Magic,** decimal key 3.
   f. Enter all amounts around these fixed decimals.
2. **SOLVE PROBLEM 1** following these steps:

Semi-Automatic Calculators

a. For Problem 1, enter 33.652 around the keyboard fixed decimal.
b. Multiply by 21.502 from right to left.
c. Shift carriage to extreme left, clear the keyboard and counter dials, but **do not clear** the register dials.
d. Follow this procedure until every multiplication has been completed.
e. The answer, 3100.679661, will be accumulated in the register dials. Round it off to two decimal places, and record it as 3100.68.
f. Clear all dials and keyboard, and complete the remaining problems.

Fully Automatic Calculators

a. **Friden**
   (1) Enter 33.652 around keyboard fixed decimal.
   (2) Enter 21.502 around multiplier keyboard fixed decimal, and depress (ACCUM MULT) bar. Then, complete the remaining multiplications.

1

33.652	×	21.502
45.633	×	16.61
76.804	×	10.835
21.156	×	17.777
20.335	×	20.205

2

35.875	×	2.375
28.755	×	4.55
65.5	×	1.125
7.375	×	4.19
36.875	×	4.495

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____

Check accuracy by accumulative multiplication:

3

36 pr.	Misses' Black Oxfords	10.75 per pr.	387.00
36 pr.	Women's Patent Leather Pumps	15.25 per pr.	547.00
72 pr.	Children's Sandals	8.95 per pr.	644.40
48 pr.	Boys' Oxfords	5.50 per pr.	264.00
	Total		1,844.40

4

36 pr.	Women's Brown Oxfords	12.15 per pr.	437.40
36 pr.	Women's Pumps	11.95 per pr.	430.20
36 pr.	Misses' One Straps	11.45 per pr.	412.20
72 pr.	Children's Pumps	7.25 per pr.	522.00
	Total		1,795.80

5

48 pr.	Boys' Black Oxfords	10.50 per pr.	504.10
36 pr.	Girls' White Sandals	15.25 per pr.	594.00
36 pr.	Girls' Backless Pumps	7.75 per pr.	279.00
72 pr.	Children's Sandals	5.50 per pr.	396.00
	Total		1,773.10

= 149 = 149

JOB NO. 49 / CONTINUED

TIMED DRILL

Instructions:

1. Prepare your calculator for accumulative multiplication.
2. Set decimal markers of 3, 3, and 6.
3. Round off the answers to two decimals.
4. Use Grading Scale No. 4 on page 187 to determine your grade.
5. If you have time, do the Timed Drill again. Record your best grade in the Achievement Chart on page 188.

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock
minutes

Subtract _____ required

Inventory Bin #1

Linens

75.125	yds.	@	1.752 per yd.
85.462	yds.	@	2.25 per yd.
65.5	yds.	@	3.75 per yd.
13.625	yds.	@	2.50 per yd.
25.875	yds.	@	4.252 per yd.
50.125	yds.	@	4.802 per yd.

Total 954.32

Inventory Bin #2

Silks

65.25	yds.	@	6.752 per yd.
80.75	yds.	@	7.50 per yd.
17.125	yds.	@	18.052 per yd.
45.625	yds.	@	12.255 per yd.
70.875	yds.	@	15.755 per yd.
31.125	yds.	@	12.752 per yd.

Total 3,428.01

Inventory Bin #3

Acetates

15.875	yds.	@	3.652 per yd.
62.162	yds.	@	1.75 per yd.
25.5	yds.	@	4.85 per yd.
17.625	yds.	@	3.25 per yd.
75.376	yds.	@	2.257 per yd.

Total 517.84

Inventory Bin #4

Broadcloth

25.75	yds.	@	8.357 per yd.
91.25	yds.	@	3.05 per yd.
13.275	yds.	@	15.752 per yd.
81.875	yds.	@	10.755 per yd.
35.125	yds.	@	14.125 per yd.

Total 2,079.32

150

b. **Marchant Fully Automatic**
   (1) Depress tab 5, because there are two whole numbers in multiplier, 21.502.
   (2) Set directional control for left to right multiplication.
   (3) Enter 33.652 on keyboard, and depress (TAB) or (CARRIAGE RETURN) key to position carriage.
   (4) Depress multiplier keys 2-1-5-0-2.
   (5) Depress (TAB) or (CARRIAGE RETURN), keyboard, and (UPPER DIAL) clear keys. Then, complete the remaining multiplications.
   (6) Change tab setting as the number of whole numbers in the multiplier changes.

c. **Marchant Deci-Magic**
   (1) Enter 33.652 around fixed decimal, and depress (×) bar.
   (2) Enter 21.502 around fixed decimal, and depress (POS =) key.
   (3) Depress (MD LOCK) key. Then, complete remaining multiplications.

d. **Monroe Fully Automatic**
   (1) Enter 33.652 around fixed decimal and depress (SET UP) or (ENTER MULTIPLIER) key.
   (2) Enter 21.502 around fixed decimal, and depress the (ACC MULT) key.
   (3) Clear the counter dials and keyboard. Then, complete remaining multiplications.

3. **RECORD ANSWER.** On all calculators, do not clear the register dials because the answer, 3100.679661, is accumulated there. Round it off to two decimal places, and record it as 3100.68.

4. **CHECK ACCURACY** of the invoice extensions in Problems 3, 4, and 5 by using accumulative multiplication. If your answer does not agree with the total, check each extension and the addition separately. Make needed corrections.

5. **COMPLETE THE TIMED DRILL,** and give the completed job to your instructor.

50 REVIEW

JOB NO. 50
REVIEW

Name _____
Period _____ Date _____
No. of Errors _____ Rating _____

Time Completed _____
Time Started _____
Minutes Required _____

AIM:

To review the operating principles presented in Job Nos. 41 through 49.

PROCEDURE

1. **CLEAR MACHINE,** and do each problem only once. Position the carriage, and set up decimal markers as follows for Problems 9-20, 24-35:
   a. Keyboard, between 5 and 4.
   b. Counter dials, between 5 and 4.
   c. Register dials, between 9 and 8.
   d. **Friden** multiplier keyboard, over 4.
   e. On the **Marchant Deci-Magic,** depress decimal key 4.

2. **SET TABS** for Problems 14-18, 32-35:
   a. **Friden** — Depress tab key 4.
   b. **Marchant** and **Monroe** — Depress tab key 5.

3. **ROUND OFF ALL ANSWERS** to two places. Record the answers to the problems in the spaces provided below or beside the problems, and in the Answers column.

4. **RECORD TIME** the job was started, the time it was completed, and the number of minutes required to complete the job in the spaces provided. In recording the time, drop fractions of a minute

1	2	3	4	5
752.02	820.40	932.15	203.75	386.40
832.84	238.09	−345.85	−584.20	−812.80
570.73	702.83			
623.46	836.32			
410.65	461.56			
989.76	624.05	6	7	8
328.23	258.63			
207.10	947.40	2.04	218.10	389.45
185.66	436.06	−1.06	− 11.75	−143.76
320.27	317.18			

9. 145.812 × 75.175 _____
10. 85.875 × 193.634 _____
11. 561.437 × 62.333 _____
12. 18.567 × 234.666 _____
13. 207.682 × 47.125 _____
14. 178.864 ÷ 1.74 _____
15. 29.467 ÷ .387 _____
16. 95.625 ÷ 21.53 _____
17. 37.489 ÷ 3.624 _____
18. 45.683 ÷ .867 _____

Find the discount and the net amount:

19. 378.25 less 15% Discount _____ Net Am't _____
20. 563.75 less 10% Discount _____ Net Am't _____

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____

151

(151)

JOB NO. 50 / CONTINUED

	182.75	+	1.58		87.86	−	2.70
	828.24	+	1.58		59.73	−	2.70
21	92.65	+	1.58	22	219.21	−	2.70
	81.57	+	1.58		216.97	−	2.70
	Total				Total		

	63	@	2.25	Accumulate:			
	75	@	2.25		25.75	×	3.055
23	48	@	2.25	24	31.25	×	2.752
	60	@	2.25		236.5	×	3.157
	54	@	2.25		163.875	×	5.50
	Total						

Find the **net amount** of the following bills:

25 545.25 less 20% - 10% - 10% _____

26 498.73 less 5% - 5% - 5% _____

27 931.76 less 20% - 20% - 5% _____

Commission on:

28 4,237.56 @ 5% _____

29 132.82 @ 2¼% _____

30 3,281.50 @ 2½% _____

31 250.75 @ 3½% _____

Find percentage of increase or decrease:

	Current	Previous	Percent +
32	9,063.72	8,727.16	
33	2,326.63	2,180.35	

	Current	Previous	Percent −
34	1,286.05	1,558.10	
35	7,601.09	7,853.50	

ANSWERS

21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____
31 _____
32 _____
33 _____
34 _____
35 _____

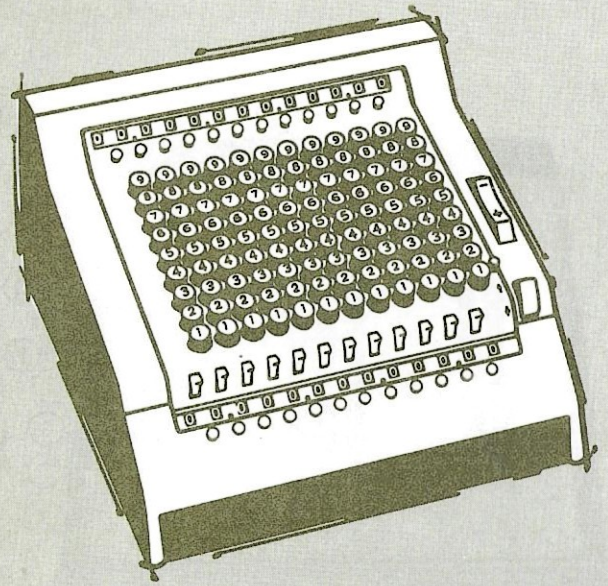
50 REVIEW

smaller than ½. Fractions larger than ½ minute but less than one full minute are recorded as ½ minute. Subtract to get the time required for completion of the job.

5. **DO JOB AGAIN,** if you have the time. Try to improve your speed.
6. **WRITE YOUR NAME** and other information required in the spaces provided at the upper center of the job sheet.
7. **GIVE JOB TO INSTRUCTOR** when completed.

NOTE: Before proceeding to the next job, ask your instructor about Test No. 10. Test Nos. 9 and 10 should be completed before you start another job.

OFFICE MACHINES COURSE



TOUCH-OPERATED, KEY-DRIVEN CALCULATOR

HIGHLIGHTS

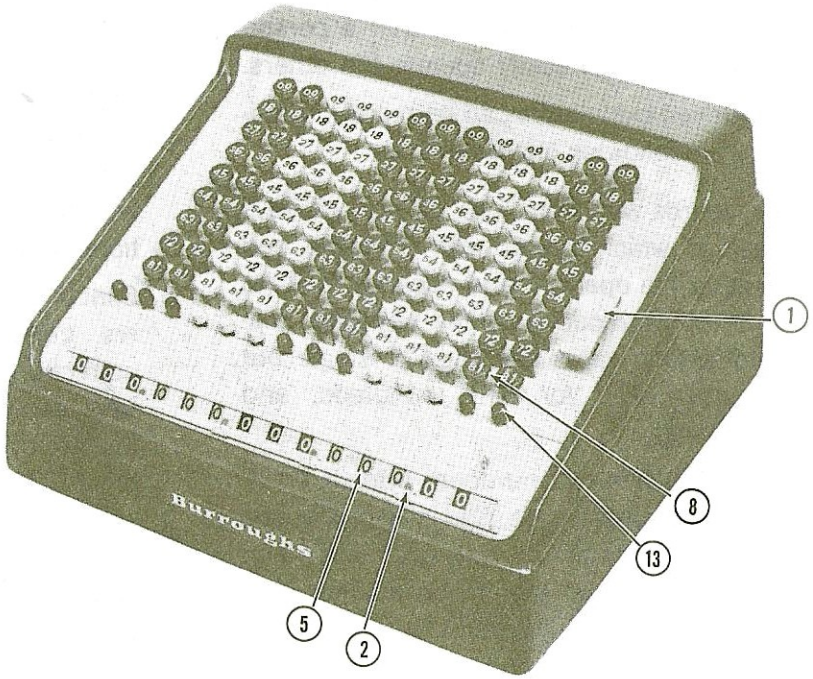
Office machines that are classified as key-driven calculators are the **Burroughs** and the **Victor Comptometer**. While not exactly alike, these machines are so similar that a person trained on one can easily operate the others.

Key-driven calculators can be readily identified by the following characteristics:

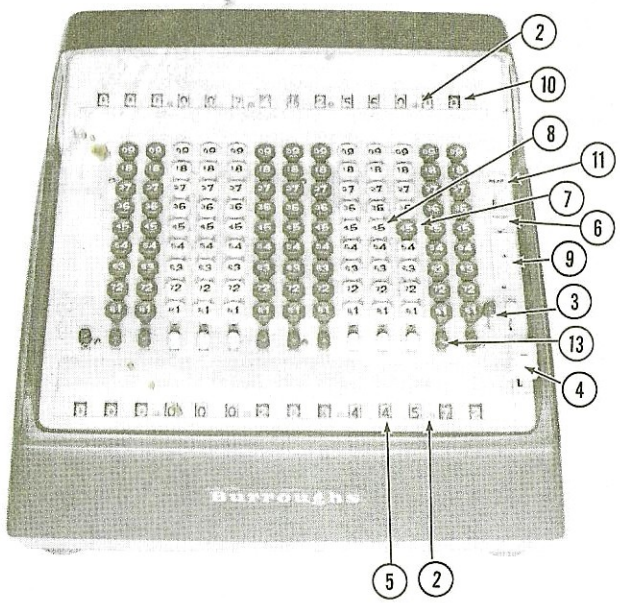
1. Keyboards with from 5 to 13 rows of keys each of which begins with 1 at the end nearest the operator and ascends to 9 (to 5 on some models) at the opposite end. Contrasting colors are used to single out columns used for tens, hundreds, and thousands.
2. Each key has two numbers printed on it. The large numbers are used in all processes; the small ones are used in subtraction and division. To facilitate touch addition, the even-numbered keys are flat while the odd-numbered keys are concave.
3. Modern, key-driven calculators are of three kinds: hand-operated, simplex electrical, and duplex electrical.
4. The answers for all calculations appear in register dials where numbers that are depressed on the keyboard are accumulated until the computation is completed. Hand-operated and simplex electrical calculators have only one set of dials, located under the keyboard. Duplex calculators have two sets of dials — one above the keyboard which is used as a memory unit, and one below the keyboard which performs the same functions as the dials on the simplex models.
5. Cancellation levers or bars, decimal markers, cut-off or subtraction control keys, correction keys, full cent keys, touch control keys, and direct subtraction keys complete the list of devices found on modern key-driven calculators.
6. The key-driven calculator is used in business to perform all the fundamental arithmetical processes. Addition and multiplication, however, are the most widely used of all the arithmetical processes. Therefore, the development of speed and accuracy in touch addition and in semi-touch multiplication are among the prime objectives of this part of the book.

TOUCH-OPERATED, KEY-DRIVEN CALCULATOR

PART NO.	MACHINE PARTS
1	Clear Bar (Key, Lever)
2	Decimal Indicator
3	Decimal Non-Transfer Key
4	Direct Subtract Bar
5	Front Registry Dials
6	Front Registry Dials Clear Key
7	Full Cent Key
8	Keyboard
9	Plus Bar
10	Rear Dials
11	Rear Dials Clear Key
12	Round-Off Control
13	Subtraction Control Keys
14	Transfer Control Bar (Positive and Negative)



Burroughs Simplex Electric



Burroughs Duplex Electric

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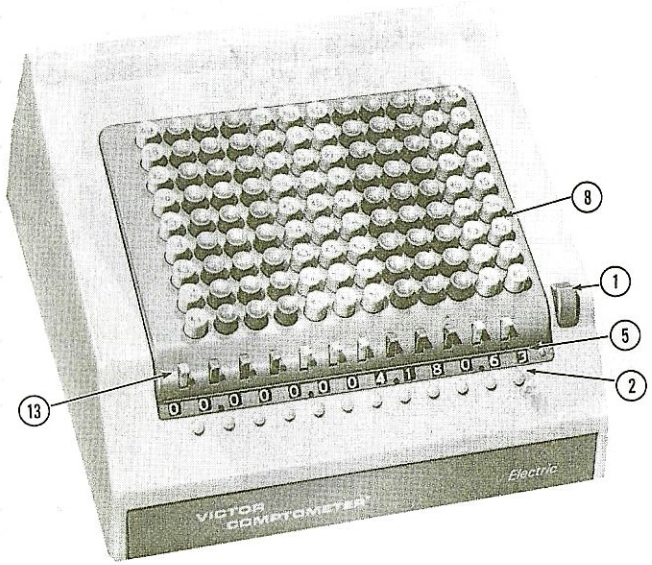
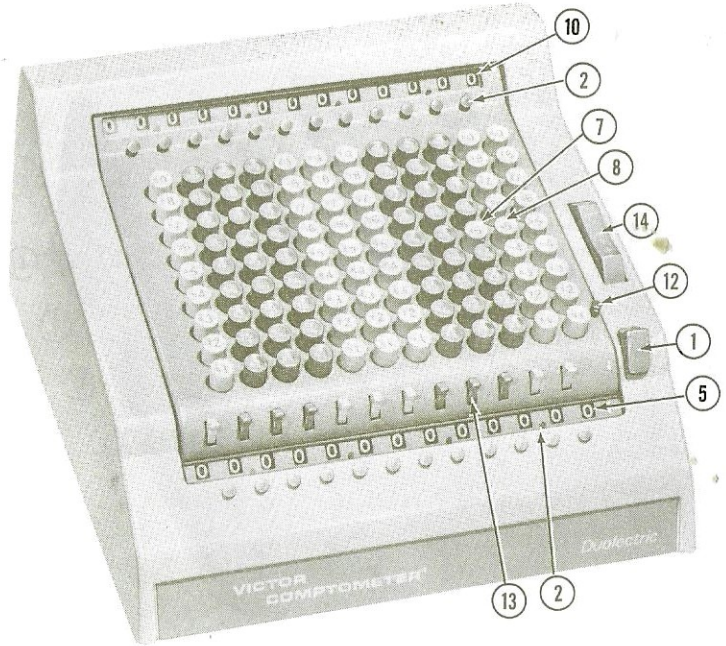
TOUCH-OPERATED, KEY-DRIVEN CALCULATOR



Victor Comptometer Electric



Victor Comptometer Duoelectric

PART NO.	MACHINE PARTS
1	Clear Bar (Key, Lever)
2	Decimal Indicator
3	Decimal Non-Transfer Key
4	Direct Subtract Bar
5	Front Registry Dials
6	Front Registry Dials Clear Key
7	Full Cent Key
8	Keyboard
9	Plus Bar
10	Rear Dials
11	Rear Dials Clear Key
12	Round-Off Control
13	Subtraction Control Keys
14	Transfer Control Bar (Positive and Negative)

TOUCH-OPERATED, KEY-DRIVEN CALCULATOR

PART NO. **MACHINE PARTS**

1 Clear Bar (Key, Lever)

2 Decimal Indicator

3 Decimal Non-Transfer Key

4 Direct Subtract Bar

5 Front Registry Dials

6 Front Registry Dials Clear Key

7 Full Cent Key

8 Keyboard

9 Plus Bar

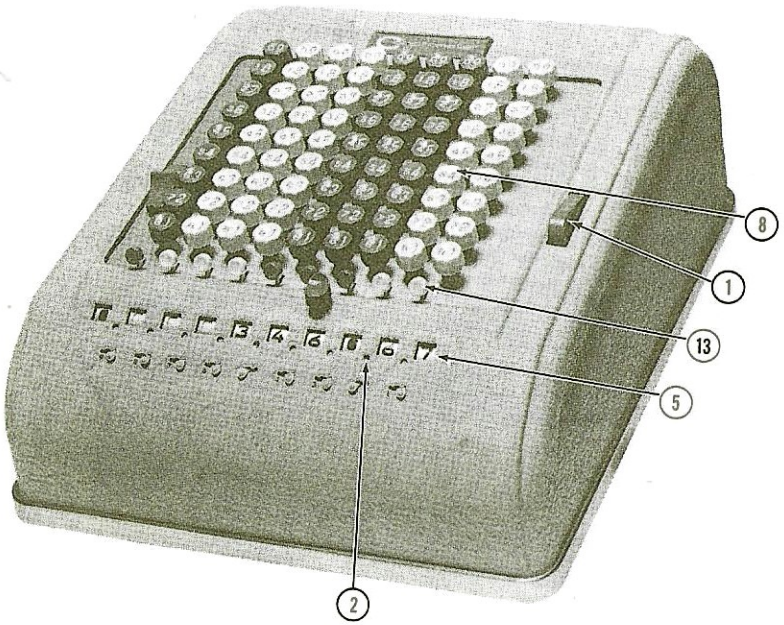
10 Rear Dials

11 Rear Dials Clear Key

12 Round-Off Control

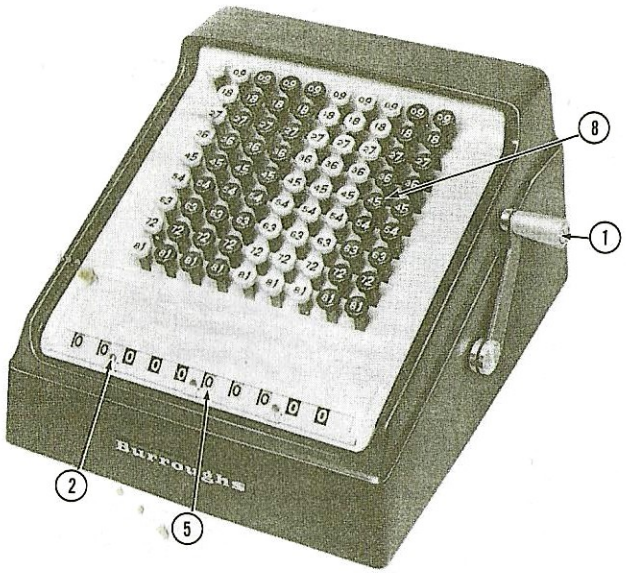
13 Subtraction Control Keys

14 Transfer Control Bar (Positive and Negative)

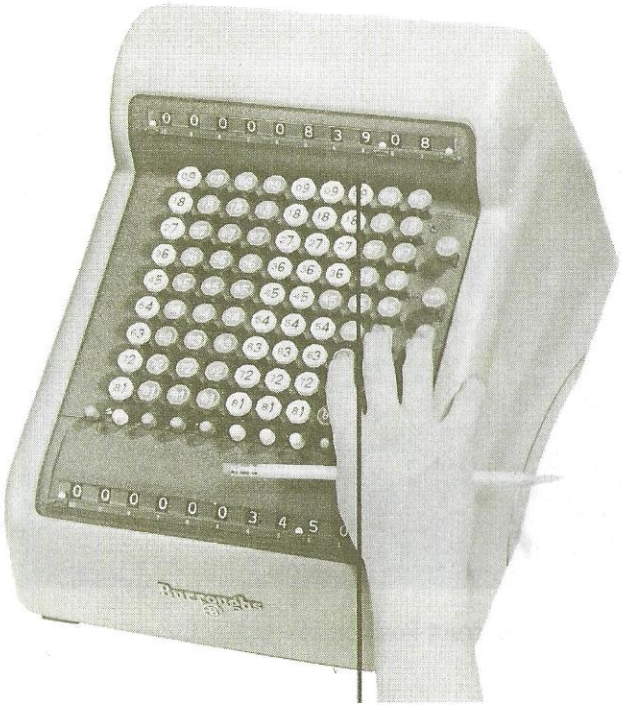


Victor Comptometer Customatic

156



Burroughs Simplex Manual



Correct Hand Position

GENERAL INSTRUCTIONS

1. Clear your desk or table of books and papers that do not pertain to this course.
2. Position your machine at a slight angle at the right of your desk or table.
3. Place this book at the left of the machine so that the book and the machine form a "V."
4. Position both the book and machine to give you ease of reading and writing.
5. Place your pencil between the thumb and the palm of your right hand with the point away from the machine.
6. Sit in a comfortable, erect position with both feet flat on the floor.
7. Clear the machine.
   a. On hand-operated calculators, use the first and/or second fingers to draw the clearance lever (located at the right of the keyboard) forward as far as it will go. Then release it quickly to allow it to return to its normal position by its own force.
   b. On simplex electrical models, use the first and/or second fingers to depress the clearance bar located at the right of the keyboard.
   c. On the **Burroughs duplex electrical** calculator, depress both the rear and front clearance keys (located at the right of the keyboard). On the **Comptometer** calculator, move the clearance lever (located at the lower right side of the keyboard) downward to clear the lower dials and upward to clear both lower and upper dials.
8. Use the touch method to depress the keys for the figures in each number.
   a. Position the right arm over the keyboard as in free-arm writing with the wrist straight. Curve the fingers as in typing.
   b. Using only the first and second fingers of the right hand, feel the tops of the odd-numbered keys and those of the even numbered keys at the right side of the machine. Become familiar with the distance between keys so that you can locate and depress them without looking at your fingers.

GENERAL INSTRUCTIONS *(Continued)*

c. Strike the keys 1 to 5 in the row at the extreme right with the second finger and those in the second row from the right with the first finger. Be sure to depress the keys fully with a bouncing touch and without pausing between strokes.

d. Depress the keys for the figures in each number in the same order in which you would write them.

e. **Do not look at your fingers;** feel for the keys. Remember, odd-numbered keys are curved; even-numbered keys are flat-topped.

f. Do not use any form of guide, such as a ruler, a blotter, or the fingers of the left hand, to assist in following the figures in a problem. **Train your eyes to follow down the column unaided.**

g. If you make a mistake or lose your place, clear the machine and start again.

9. Develop speed and accuracy in recording answers by:

   a. Forming the habit of making a clear image of the answer in your mind just before clearing the dials.

   b. Writing the answer quickly and clearly under the problem.

   c. Immediately doing the problem a second time, adding in the opposite direction from the first time.

      (1) If the second answer is the same as the first, write it in the proper space at the right of the page.

      (2) If the second answer is different from the first, write it directly below the first answer, and do problem again. Write the answer that proves to be correct at the right of the page.

Correct Position at the Machine

(158)

51 ADDITION

JOB NO. 51
ADDITION — ONE- AND TWO-KEY REACHES

Name _____ No. of Errors _____
Period _____ Date _____ Rating _____

AIM:

To introduce the procedure for touch-addition of numbers involving one- and two-key reaches.

PROCEDURE

1. **CLEAR MACHINE.** Draw the clearance lever forward, depress the clear bars, or move the lever upward on the **Comptometer Duplex** machine. All dials must register 0's before any problem is started.
2. **PLACE DECIMAL MARKER** between rows 3 and 2.
3. **ADD NUMBERS** in Problem 1, starting at the top and working down the column, as follows:
   a. Place the tip of the first finger on the 3 key of the second row from the right, and with a quick, firm stroke depress the key fully, releasing it immediately.
   b. Place the tip of the second finger on the 3 key of the first row at the extreme right, and with a quick, firm stroke depress it fully, releasing it immediately.
   c. **Do not depress both keys at once.** In touch addition, keys are depressed separately in the order in which they are read.
   d. Add the remaining numbers, reaching up for 4's and 5's and down for 2's and 1's.
   e. Use the touch method — feel for the keys, **do not look at your fingers.**
   f. Keep up a continuous, bouncing rhythm as you add. **Do not hesitate between strokes.**

1	2	3	4	5	6
.33	.33	.44	.55	.33	.22
.44	.22	.33	.44	.22	.11
.33	.11	.34	.45	.23	.12
.44	.22	.44	.55	.33	.22
.55	.33	.33	.44	.22	.11
.44	.44	.34	.45	.21	.12
.33	.55	.44	.55	.11	.22

7	8	9	10	11	12
.54	.32	.54	.45	.11	.43
.43	.21	.43	.54	.21	.23
.32	.22	.32	.43	.12	.32
.21	.32	.21	.32	.22	.21
.22	.43	.12	.21	.23	.12
.21	.54	.23	.12	.32	.22
.32	.55	.34	.23	.33	.23

13	14	15	16	17	18
.12	.21	.13	.42	.53	.43
.13	.22	.23	.24	.35	.35
.31	.23	.33	.44	.54	.42
.13	.24	.35	.21	.53	.21
.31	.24	.54	.13	.33	.22
.13	.44	.44	.31	.34	.24
.31	.43	.32	.22	.32	.45

= 159

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____

JOB NO. 51 / CONTINUED

TIMED DRILL

In the spaces provided below, record the starting and finishing time. Drop fractions of a minute smaller than ½. Fractions larger than ½ minute but less than one full minute are recorded as ½ minute. Subtract to get the time required for completion of the drill.

Finished at _____ o'clock

Started at _____ o'clock
minutes

Subtract _____ required

1. Do each problem **only** once.
2. Place a check mark (✓) next to the answer if your answer is correct; an (X) if incorrect.
3. Count (X's) and use Grading Scale No. 2 on page 187 to determine your grade.
4. If you have time, do the Timed Drill again. Try to better your time.
5. Record your best grade on the Achievement Chart on page 188.

1	2	3	4	5	6	7
.22	.33	.33	.44	.55	.33	.54
.32	.43	.23	.34	.54	.43	.43
.33	.44	.22	.34	.44	.44	.32
.23	.34	.32	.43	.45	.34	.21
.22	.33	.33	.44	.44	.43	.12
.32	.43	.23	.34	.54	.44	.23
.33	.44	.22	.33	.55	.34	.34
.23	.34	.32	.43	.45	.33	.45
.22	.33	.33	.44	.44	.43	.54
2.42	3.41	2.53	3.53	4.40	3.51	3.18

8	9	10	11	12	13	14
.11	.12	.21	.23	.24	.32	.11
.12	.21	.43	.32	.42	.42	.13
.22	.23	.24	.23	.42	.24	.22
.23	.32	.32	.21	.43	.23	.24
.33	.43	.54	.12	.35	.35	.44
.34	.34	.31	.23	.35	.53	.42
.44	.54	.42	.34	.54	.33	.22
.45	.45	.24	.45	.43	.34	.24
.55	.43	.42	.54	.33	.42	.45
2.79	3.07	3.13	2.67	3.51	3.18	2.47

= 160

g. Work at near maximum speed from the beginning. Speed in touch addition is of prime importance.

4. **RECORD ANSWER.** Look in the dials for the answer to Problem 1, make a mental note of it, clear the dials, and quickly and clearly record it, 2.86, in the space provided below the problem.

5. **DO THE PROBLEM AGAIN** immediately, beginning at the bottom and adding upward.
   a. If the second answer is the same as the first, write it in the space provided at the right of the page.
   b. If the second answer is different from the first, write it directly below the first answer, and do the problem again. Write the answer that proves correct at the right of the page.

6. **COMPLETE REMAINING PROBLEMS** following the same procedure. If you are operating a **Comptometer,** the machine will lock when you fail to depress a key fully. When this happens, go back to the key you depressed **before** the machine locked, and depress it all the way. Unlock the keyboard by depressing the release key (located below the keyboard), and continue the adding, starting with the key that locked and signaled the error.

7. **COMPLETE THE TIMED DRILL.** Record the time you started and completed the drill in the spaces provided. Use Grading Scale No. 2 on page 187 to determine your grade. Always record it in the Achievement Chart on page 188.
   a. If you have time, do the Timed Drill again. Try to better your time.

8. **GIVE JOB TO INSTRUCTOR** when completed.

52
TOUCH ADDITION OF 6's, 7's, 8's, AND 9's

JOB NO. 52
TOUCH ADDITION OF 6's, 7's, 8's, AND 9's

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To introduce the procedures for touch addition of the 6, 7, 8, and 9 keys.
2. To present the method of indexing zeros.

HIGHLIGHTS

Touch addition on a key-driven calculator restricts an operator to the use of five keys — the 1 to 5 keys only. This restriction avoids ascents and descents in excess of four keys.

To add numbers in excess of 5, use the following combination of keys 1 to 5:

To add 6, depress 3 twice in row one.
To add 60, depress 3 twice in row two.
To add 600, depress 3 twice in row three.
To add 6000, depress 3 twice in row four.

To add 7, 70, 700, 7000, depress 4 and 3 in the proper rows as indicated for 6's.

To add 8, 80, 800, 8000, depress 4 twice in the proper rows as indicated for 6's.

To add 9, 90, 900, 9000, depress 5 and 4 in the proper rows as indicated for 6's.

To add zeros, **do not depress** any keys in the rows in which they occur.

PROCEDURE

1. **CLEAR MACHINE,** and set a decimal marker between the second and third dials.
2. **USE THE TOUCH METHOD** to depress the keys for the numbers in each problem, being careful to:

1	2	3	4	5
.33	.60	.44	.77	.06
.06	.06	.33	.73	.60
.33	.66	.34	.37	.33
.60	.33	.07	.77	.36
.33	.36	.70	.37	.63
.66	.66	.77	.73	.07
.30	.60	.33	.77	.70
.33	.63	.34	.44	.73
.06	.33	.07	.33	.76
.33	.36	.70	.73	.67
.60	.63	.77	.37	.63
.33	.06	.70	.47	.73

6	7	8	9	10
.44	.48	.60	.55	.44
.80	.84	.66	.90	.90
.08	.40	.67	.09	.09
.44	.08	.70	.59	.49
.48	.80	.76	.95	.94
.48	.84	.80	.99	.99
.84	.48	.68	.59	.49
.84	.88	.86	.95	.94
.80	.80	.67	.99	.99
.84	.08	.76	.90	.90
.48	.44	.68	.09	.09
.08	.88	.78	.59	.59

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

161

JOB NO. 52 / CONTINUED

11	12	13
.67	.60	.70
.76	.67	.68
.66	.70	.86
.68	.78	.80
.86	.80	.79
.88	.89	.97
.89	.90	.90
.98	.98	.69
.90	.89	.96
.09	.87	.79
.80	.70	.07
.08	.86	.68

ANSWERS

11 _____

12 _____

13 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock
minutes

Subtract _____ required

TIMED DRILL

1	2	3	4	5	6	7	8
.34	.40	.12	.43	.54	.30	.67	.98
.48	.48	.13	.12	.43	.60	.88	.40
.30	.54	.30	.22	.21	.64	.78	.66
.40	.80	.16	.23	.22	.06	.99	.80
.26	.36	.34	.24	.23	.35	.68	.67
.42	.24	.37	.30	.26	.79	.67	.30
.20	.40	.30	.48	.30	.50	.98	.68
.26	.36	.03	.50	.46	.88	.68	.89
.12	.35	.67	.54	.40	.60	.76	.07
.32	.32	.30	.63	.45	.67	.89	.69
.13	.94	.31	.31	.90	.89	.79	.86
.31	.40	.13	.03	.40	.78	.50	.67
.13	.45	.35	.67	.35	.68	.88	.78
.23	.54	.54	.50	.45	.96	.60	.89
.31	.42	.44	.59	.95	.79	.67	.98
4.21	7.00	4.49	5.79	6.55	9.49	11.42	10.32

= 162

52 TOUCH-ADDITION OF 6's, 7's, 8's AND 9's

a. Depress each key **separately** with a bounce and rhythmic touch. Be sure to depress each key fully.
b. Not depress any keys for zeros.
c. Use combinations of two 3's for 6, a 4 and 3 for 7, two 4's for 8, and a 5 and 4 for 9.
d. Keep eyes on the book. Keep your place with your eyes; do not use a guide.
e. Do each problem twice; Add downward the first time, and upward the second time.
f. Record the answers quickly, legibly, and accurately in the spaces provided.

3. COMPLETE THE TIMED DRILL. See the instructions given in Job No. 51, page 160, if necessary. Use Grading Scale No. 2 to determine your grade.

4. GIVE JOB TO INSTRUCTOR when completed.

53 TOUCH ADDITION OF THREE- AND FOUR-DIGIT NUMBERS

JOB NO. 53
TOUCH ADDITION OF THREE- AND FOUR-DIGIT NUMBERS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To introduce the touch addition procedures followed for adding three- and four-digit numbers.

PROCEDURE

ADDING THREE-DIGIT NUMBERS

1. **CLEAR MACHINE,** and set a decimal marker between rows three and two.
2. **POSITION FINGERS.** Place the first and second fingers over the keys of rows two and one at the right for the corresponding digits in the item to be added.
3. **DEPRESS FIRST FIGURE.** With the first finger, reach over one row to the left and strike the key for the first figure on the left of the three-digit number.
   a. Be sure to strike the center of the key, striking the side might result in a partial stroke.
   b. Do not look at your finger; "feel" your way across.
4. **STRIKE THE KEY** for the second figure, row two, with the same finger (the first).
5. **STRIKE THE KEY** for the last figure in row one with the **second** finger.
6. **DO EACH PROBLEM TWICE;** add downward the first time, and upward the second time.
7. **RECORD ANSWERS** quickly, legibly, and accurately in the spaces provided.

1	2	3	4	5
3.33	2.23	3.30	4.44	3.34
3.34	3.34	3.34	4.55	4.45
4.44	4.45	4.40	5.55	5.54
4.45	5.55	4.45	5.44	5.40
5.55	5.54	5.50	4.33	4.80

6	7	8	9	10
5.54	4.43	5.54	3.22	5.90
4.44	3.32	4.04	2.11	4.70
4.43	2.22	4.43	1.11	3.63
3.33	1.11	3.03	1.22	3.23
3.32	1.21	3.32	2.33	3.44

11	12	13	14	15
2.22	2.23	2.02	3.44	4.76
2.21	3.34	2.21	4.55	3.03
1.11	4.45	1.01	5.44	2.11
1.12	5.54	1.11	4.33	1.01
3.48	3.44	2.46	9.43	3.34

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

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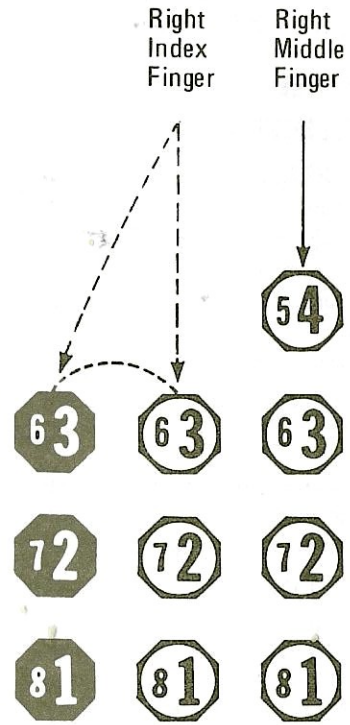
16	17	18	19	20
.42	2.23	.34	5.99	5.38
3.06	.31	.56	4.34	6.89
4.98	.22	2.24	3.67	5.50
7.39	2.36	3.35	6.78	6.46
.48	.24	.67	8.45	3.66
.67	4.33	3.21	9.54	7.34
4.70	.31	1.23	.45	3.37
2.22	3.43	.12	.58	4.16
2.06	.45	.31	8.33	8.42
.67	2.02	3.23	2.34	2.34

21	22	23	24	25
4.04	3.37	.75	5.52	1.23
5.03	6.67	.54	4.42	3.21
3.03	4.48	.34	.48	1.23
4.02	8.84	9.04	.84	3.21
3.05	5.59	.21	.42	5.43
2.04	9.95	4.06	.24	3.45
4.02	4.02	5.78	4.65	9.69
5.03	7.73	6.89	5.13	4.49
3.01	3.77	.45	4.22	6.56
4.02	2.28	.58	2.24	3.20

ANSWERS

16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____

53 TOUCH ADDITION OF THREE- AND FOUR-DIGIT NUMBERS



Fingering for Depressing Keys for 3.34.

53 TOUCH ADDITION OF THREE- AND FOUR-DIGIT NUMBERS

ADDING FOUR-DIGIT NUMBERS

1. **POSITION FINGERS.** Place the first and second fingers over the keys of rows two and one at the right for the corresponding digits in the item to be added.
2. **DEPRESS FIRST TWO FIGURES.** With the first finger, reach over two rows to the left and strike keys for the first two figures of the number in rows four and three respectively.
   a. Be sure to strike the center of the key; striking the side might result in a partial stroke.
   b. Do not look at your fingers, "feel" your way across.
3. **STRIKE THE KEY** for the second figure in row two with the same finger (the first).
4. **STRIKE THE KEY** for the last figure in row one **with the second finger.**
5. **NOTICE THE FINGER PLACEMENT** for touch addition. The first finger depresses all keys for the figures in a number **except the last figure** at the right. The second finger depresses **only the last figure** at the right of a number.
6. **DO EACH PROBLEM TWICE;** add downward the first time, and upward the second time.
7. **RECORD THE ANSWERS** quickly, legibly, and accurately in the spaces provided.

JOB NO. 53 / CONTINUED Name_____ Period_____

26	27	28	29	30
33.33	22.22	33.32	33.04	33.06
33.34	22.21	22.22	44.05	44.07
44.44	11.11	11.11	55.08	55.08
44.45	11.12	11.21	88.09	44.09
55.55	22.23	22.23	99.08	94.44

31	32	33	34	35
55.54	33.34	33.34	88.07	85.55
44.44	44.45	44.45	77.06	64.77
44.43	55.55	55.54	66.05	73.33
33.33	55.54	44.43	55.04	84.44
33.32	44.43	33.32	44.03	63.33

36	37	38	39	40
94.33	73.23	63.43	67.78	43.26
63.44	34.84	84.45	63.45	36.35
73.22	84.54	84.36	84.58	48.76
34.88	63.48	64.86	48.32	63.45
63.34	73.32	23.46	48.45	45.37

ANSWERS

26 _____
27 _____
28 _____
29 _____
30 _____
31 _____
32 _____
33 _____
34 _____
35 _____
36 _____
37 _____
38 _____
39 _____
40 _____

165

JOB NO. 53 / CONTINUED

41	42	43	44	45
55.06	12.27	21.26	48.76	4.60
50.54	12.32	62.38	63.40	1.35
48.07	73.21	30.60	22.45	40.53
70.48	23.20	45.03	36.60	3.54
98.03	21.10	86.20	35.50	40.23

ANSWERS

41 _____

42 _____

43 _____

44 _____

45 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

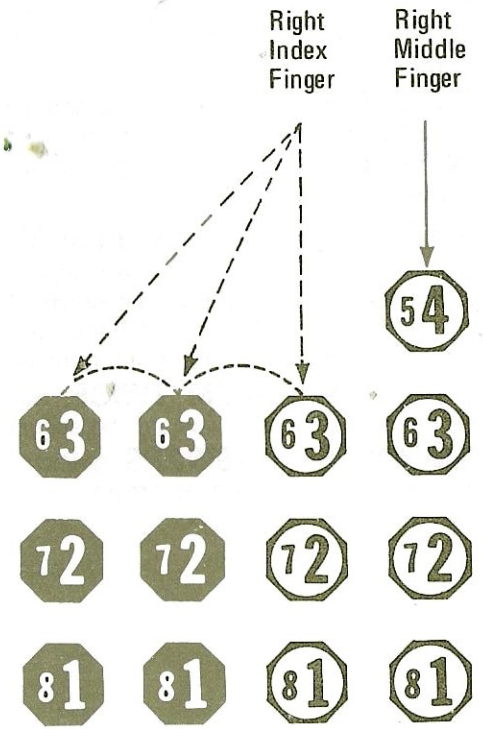
TIMED DRILL

1	2	3	4	5	6
1.35	2.12	3.40	63.04	88.05	33.07
5.45	3.42	8.43	20.24	48.95	70.34
4.53	4.45	7.34	36.06	86.34	89.04
3.54	3.35	3.72	30.63	54.02	40.98
4.23	5.45	6.78	54.08	23.04	54.06
4.53	2.35	3.20	94.03	40.23	67.02
4.53	4.45	7.34	36.06	86.34	89.04
28.16	25.59	40.21	334.14	426.97	443.55

53 TOUCH ADDITION OF THREE- AND FOUR-DIGIT NUMBERS

After all problems have been completed:

1. **COMPLETE THE TIMED DRILL.** See the instructions given in Job No. 51, page 160, if necessary. Use Grading Scale No. 2 to determine your grade.
2. **GIVE JOB TO INSTRUCTOR** when completed.



Fingering for Depressing Keys for 33.34.

54 MULTIPLICATION

JOB NO. 54
MULTIPLICATION

Name _____ No. of Errors _____
Period _____ Date _____ Rating _____

AIMS:

1. To present the use of keys from 1 to 9 for multiplication.
2. To develop the ability to "slide" from one row of keys to another without looking.

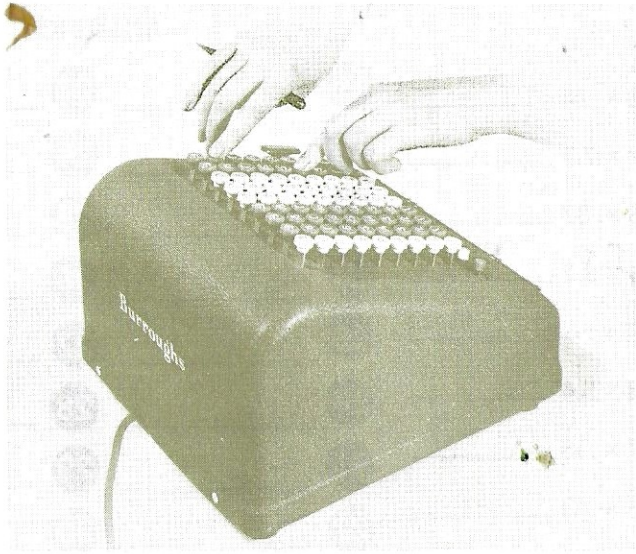
HIGHLIGHTS

Multiplication makes use of **all** the keys. If the multiplicand contains a 6, you use the "6" key, not two 3's. The same applies to 7's, 8's, and 9's. In multiplication, you look at your fingers **only** to "set" them on the keys for the number to be multiplied. The rest of the process — depressing the keys and moving over one row to the left — is by the touch method. It is recommended that both hands be used even if the multiplicand contains only two digits. Multiplication is accomplished by **repeated addition.**

PROCEDURE

To complete Problem 1:

1. **CLEAR MACHINE.**
2. **LOOK** while you place the tip of the first finger of the left hand over the 4 key of the second row of keys, and the tip of the first finger of the right hand over the 8 key of the first row of keys.
3. **CHECK YOUR POSTURE** to see that your fingers are curved slightly, elbows off the desk, wrists flat, and arms extended.
4. **TURN YOUR EYES AWAY** from the keyboard and back to the multiplier.



Striking 48 in Multiplication

1. 48 × 23 _____
2. 58 × 35 _____
3. 35 × 19 _____
4. 15 × 47 _____
5. 26 × 65 _____
6. 73 × 58 _____
7. 47 × 4 _____
8. 62 × 5 _____
9. 87 × 27 _____
10. 29 × 53 _____
11. 48 × 67 _____
12. 52 × 36 _____
13. 53 × 42 _____
14. 19 × 7 _____

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

167

(167)

JOB NO. 54 / CONTINUED

				ANSWERS	
15	45 × 32 _____	23	.85 × .24 _____	15 _____	23 _____
16	34 × 25 _____	24	.47 × 7.3 _____	16 _____	24 _____
17	56 × 34 _____	25	.65 × 87 _____	17 _____	25 _____
18	75 × 46 _____	26	.54 × 3.2 _____	18 _____	26 _____
19	79 × 23 _____	27	21 × 56 _____	19 _____	27 _____
20	64 × 55 _____	28	23 × 5.4 _____	20 _____	28 _____
21	19 × 18 _____	29	6.7 × .98 _____	21 _____	29 _____
22	35 × 14 _____	30	.56 × .43 _____	22 _____	30 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

1	2	3	4
.94	.65	6.43	9.34
.50	.30	2.39	7.80
.36	.47	7.50	3.74
.75	.65	2.48	5.90
.89	.98	9.63	7.84
.07	.09	1.22	8.75
.45	.53	8.37	3.98
~~.80~~	.70	4.04	2.24
~~.79~~	.76	8.75	4.80
.50	.40	3.49	5.85
6.05	5.53	54.30	60.24

168

5	26 × .47	12.22
6	41 × 34	1,394
7	37 × 52	1,924
8	67 × 35	2,345
9	76 × 7	532
10	78 × 91	7,098
11	.46 × 2.3	1,058
12	3.1 × .56	1,736
13	37 × 4.5	166.5
14	9.2 × .67	6.164
15	65 × .7	455

54 MULTIPLICATION

5. **STRIKE THE KEYS,** simultaneously and rhythmically, three times as indicated by the figure at the **right of the multiplier**, 23. Raise the fingers slightly after each depression.
6. **SLIDE BOTH FINGERS** over one row to the left. **Do not look** at your fingers as you move them. The first finger of the left hand is now on 4 of the third row, and the first finger of the right hand is on 8 of the second row.
7. **STRIKE THE KEYS,** simultaneously and rhythmically, twice for the second figure (from the right) of the multiplier, 23.
8. **RECORD ANSWER,** 1104, in the space provided, and immediately do the problem again. Record the answer that proves correct in the Answers column at the right.
9. **COMPLETE PROBLEMS 2-22** using the same procedure.

To complete Problem 23:

1. **COUNT NUMBER OF DECIMALS** in the multiplier, and add them to the number of decimals in the multiplicand. In Problem 23, there are two in the multiplier, .24, and two in the multiplicand, .85, which makes four to be pointed off in the answer.
2. **MOVE DECIMAL MARKER** between dials 5 and 4, and multiply as usual.

After all problems have been completed.

1. **COMPLETE THE TIMED DRILL** as usual, and use Grading Scale No. 3 on page 187 to determine your grade.
2. **GIVE JOB TO INSTRUCTOR** when completed.

55 ADDITION — THREE- AND FOUR-KEY ASCENTS AND DESCENTS

JOB NO. 55
ADDITION — THREE- AND FOUR-KEY ASCENTS AND DESCENTS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To present the use of the touch method for three- and four-key ascents and descents.

PROCEDURE

1. **CLEAR MACHINE.**
2. **PRACTICE REACHING** from 5 to 2 and from 2 to 5 before doing Problem 1-6.
   a. Be sure to strike the center of each key; striking the side may result in a partial stroke.
   b. Memorize the "feel" of reaching up and down between 5 and 2.
3. **PRACTICE REACHING** from 5 to 1 and from 1 to 5 before doing Problems 7-10.
   a. Be sure to strike the center of each key.
   b. Memorize the "feel" of these long reaches.
4. **USE THE TOUCH METHOD** to add first **downward** and then **upward** to prove the accuracy of your answer. Be sure to:
   a. Reach directly up or down to the key, even though this may involve a four-key ascent or descent. **Do not** "climb" up one key at a time.

1	2	3	4	5
.22	.22	.55	.11	.22
.44	.55	.22	.44	.25
.22	.22	.55	.11	.52
.55	.55	.22	.44	.11
.22	.25	.52	.11	.14
.33	.22	.55	.44	.41
.22	.55	.52	.14	.22
.44	.25	.55	.44	.25
.22	.22	.42	.14	.52
.55	.55	.52	.33	.11

6	7	8	9	10
.11	.11	.15	.33	.33
.33	.55	.51	.24	.42
.22	.11	.15	.15	.51
.55	.55	.51	.25	.41
.11	.33	.31	.33	.55
.55	.11	.13	.24	.42
.11	.55	.15	.15	.51
.55	.22	.51	.25	.41
.33	.55	.21	.33	.33
.11	.11	.12	.24	.42

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

169

(169)

JOB NO. 55 / CONTINUED

11	12	13
4.35	.42	.69
8.63	.15	.31
.52	.21	.25
2.01	.45	.10
.49	.32	.36
.41	.81	.48
.42	.26	.02
.28	.51	.15
8.92	.83	.46
.14	.51	.89
7.08	.15	.24
.41	.25	.37

ANSWERS

11 _____

12 _____

13 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6	7	8
.12	.83	.25	.57	2.49	9.31	9.32	.24
.27	.42	.49	.31	.86	.54	.81	5.58
.93	.22	.36	.25	.42	4.57	6.43	.71
.55	.37	.24	.15	7.74	6.31	.15	.15
.45	.65	.53	.31	2.08	.73	1.26	6.92
.13	.44	.24	.54	.45	3.42	.90	.60
.21	.31	.63	.73	.29	.13	7.63	.51
.47	.28	.48	.42	.63	.25	.21	1.43
.20	.97	.54	.13	9.12	.15	.45	2.80
.32	.23	.43	.15	8.43	8.73	4.51	.72
.85	.69	.32	.51	8.30	.42	5.25	.11
.12	.55	.38	.42	.10	.51	5.42	1.15
4.62	5.96	4.89	4.49	40.91	35.07	42.34	20.92

E= 170

55 ADDITION — THREE- AND FOUR-KEY ASCENTS AND DESCENTS

b. Make a mental note of any reaches that cause a break in the rhythmical striking of the keys. Before you add the column a second time, practice reaching to the keys that caused the trouble.
c. Increase your speed the second time you add a column of numbers.

5. COMPLETE THE TIMED DRILL as usual, and use Grading Scale No. 2 on page 187 to determine your grade.

a. If you have time, do the Timed Drill again. Try to better your time.
b. Record your best grade on the Achievement Chart on page 188.

6. GIVE JOB TO INSTRUCTOR when completed.

NOTE: Before proceeding to Job No. 56, ask your instructor about Test No. 11. He may want you to complete it before you start Job No. 56.

56 MULTIPLICATION — THREE- AND FOUR-DIGIT COMBINATIONS

JOB NO. 56
MULTIPLICATION — THREE- AND FOUR-DIGIT COMBINATIONS

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To develop speed and accuracy in the use of the **natural,** the **inverted,** the **interposed,** and the **cross hand** multiplication fingering techniques.

HIGHLIGHTS

To hold three- and four-digit multiplicands, observe these rules:

1. Use the longest finger (the second finger) on the highest figures.
2. Use both hands. Avoid using the thumbs.
3. Curve the fingers slightly, and keep elbows off the desk.
4. Once the fingers are set to hold the multiplicand, "**freeze**" them so that the distance between fingers does not change.
5. Move all fingers in unison both in striking the keys and moving one row of keys to the left.
6. Look at your fingers **only** to set them on the keys. Striking the keys and moving from one row to another is by the touch method.

PROCEDURE

Natural Fingering Combinations

To do problems involving three-digit combinations, follow the steps listed below for solving Problem 1.

1. **LOOK** while you place the tip of the first finger of the left hand on 5 in row three (from the right), and the tips of the first and second fingers of the right hand on 3 and 5 in rows two and one.
2. **CHECK YOUR POSTURE** to see that your fingers are curved slightly, elbows off the desk, and wrists flat.

THE NATURAL FINGERING COMBINATIONS

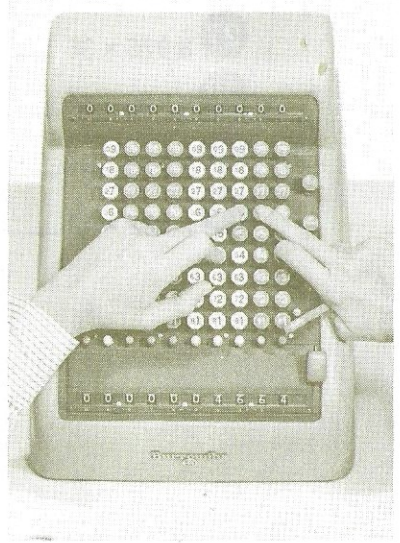
Three-digit Multiplicands

1. 535 × 656 _____
2. 424 × 535 _____
3. 413 × 757 _____
4. 212 × 858 _____
5. 545 × 423 _____
6. 412 × 813 _____
7. 267 × 612 _____
8. 157 × 861 _____
9. 257 × 213 _____
10. 713 × 414 _____

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

The Natural Fingering Position



The Inverted Fingering Position

JOB NO. 56 / CONTINUED

THE NATURAL FINGERING COMBINATIONS

Four-digit Multiplicands

11 7,557 × 45 _____
12 4,224 × 83 _____
13 5,225 × 74 _____
14 2,112 × 36 _____
15 6,424 × 34 _____
16 5,257 × 63 _____
17 8,668 × 74 _____
18 6,457 × 86 _____
19 7,546 × 36 _____
20 6,545 × 52 _____

THE INVERTED FINGERING COMBINATIONS

Four-digit Multiplicands

21 5,775 × 53 _____
22 2,475 × 74 _____
23 2,675 × 87 _____
24 6,731 × 66 _____
25 3,543 × 85 _____
26 6,754 × 55 _____
27 8,976 × 36 _____
28 3,531 × 48 _____
29 5,775 × 54 _____
30 2,332 × 43 _____

ANSWERS

11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____

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56 MULTIPLICATION—THREE- AND FOUR-DIGIT COMBINATIONS

3. **TURN YOUR EYES AWAY** from the keyboard and back to the multiplier.
4. **STRIKE THE KEYS,** simultaneously and rhythmically, six times as indicated by the figure at the **right of the multiplier**, 656. Raise the fingers slightly after each depression.
5. **SLIDE THE FINGERS** over one row to the left. **Do not look at your fingers** as you move them.
6. **STRIKE THE KEYS** five times for the second figure in the multiplier, and again **slide** the fingers over one row to the left. **Do not take your eyes off** the printed multiplier.
7. **STRIKE THE KEYS** six times for the last figure in the multiplier, and record the answer, 350,960, in the space provided.
8. **DO THE PROBLEM AGAIN,** and record the verified answer in the Answers column at the right.
9. **COMPLETE PROBLEMS 2-10** in the same manner.

To do problems involving four-digit combinations in which the first and last figures are **higher** than the second and third figures, follow the steps listed below for solving Problem 11.

1. **POSITION FINGERS.** Place the first and second fingers of the left hand on 7 and 5 in rows four and three. Place the first and second fingers of the right hand on 5 and 7 in rows two and one.
2. **STRIKE THE KEYS** simultaneously five times.
3. **SLIDE OVER ONE ROW** to the left and strike the keys simultaneously four times.
4. **DO THE PROBLEM AGAIN,** and record the verified answer, 340,065, in the spaces provided.
5. **COMPLETE PROBLEMS 12-20** in the same manner.

56 MULTIPLICATION—THREE- AND FOUR-DIGIT COMBINATIONS

Inverted Fingering Combinations

To do problems involving four-figure combinations in which the first and last figures are **lower** than the second and third figures, follow the steps listed below for solving Problem 21:

1. **POSITION FINGERS.** Place the first and second fingers of the left hand on 5 and 7 in rows four and three. Place the first and second fingers of the right hand on 7 and 5 in rows two and one.
2. **TURN HANDS OUTWARD** and raise your elbows slightly.
3. **MULTIPLY** as usual, using the touch method.
4. **VERIFY YOUR ANSWER,** 306,075, and record it in the spaces provided.

Interposed Fingering Combinations

The interposed fingering technique is used when a **high** figure comes between two **low** ones, or when a **low** figure comes between two **high** ones. Problems 31-40 give you practice in using this technique.

To do Problems 31-40, follow the steps listed below for solving Problem 31.

1. **POSITION FINGERS.** Place the tips of the first and second fingers of the right hand on 2 and 3 in rows four and two.
2. **INTERPOSE FIRST TWO FINGERS** of the left hand with those of the right by placing the tips of the first and second fingers on 8 and 6 in rows three and one.
3. **MULTIPLY** as usual, using the touch method.

JOB NO. 56 / CONTINUED Name_____ Period_____

THE INTERPOSED FINGERING COMBINATIONS

Four-digit Multiplicands

31 2,836 × 82 _____
32 7,162 × 24 _____
33 1,736 × 76 _____
34 6,253 × 28 _____
35 8,475 × 73 _____
36 3,517 × 72 _____
37 8,283 × 12 _____
38 8,162 × 62 _____
39 4,728 × 46 _____
40 7,253 × 52 _____

THE CROSS HAND FINGERING COMBINATIONS

Four-digit Multiplicands

41 1,375 × 57 _____
42 6,843 × 29 _____
43 5,821 × 41 _____
44 7,831 × 21 _____
45 1,386 × 29 _____
46 3,575 × 53 _____
47 2,365 × 67 _____
48 1,353 × 52 _____
49 1,465 × 38 _____
50 3,598 × 53 _____

ANSWERS

31 _____
32 _____
33 _____
34 _____
35 _____
36 _____
37 _____
38 _____
39 _____
40 _____
41 _____
42 _____
43 _____
44 _____
45 _____
46 _____
47 _____
48 _____
49 _____
50 _____

JOB NO. 56 / CONTINUED

MULTIPLICATION FINGERING COMBINATIONS REVIEW

51 80.9 × 24 _____

52 6,434 × .45 _____

53 254.3 × 3.1 _____

54 1,486 × 70 _____

55 817.3 × 6.4 _____

TIMED DRILL

1	2	3
.24	9.34	5.94
8.07	.76	7.02
.22	3.31	1.21
.35	.41	.45
.41	.25	.82
2.34	.54	2.34
.55	7.86	6.31
.90	6.02	.25
1.13	.24	.90
.54	.31	.53
3.60	.14	3.30
.92	4.05	.24
19.27	33.23	29.31

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ANSWERS

51 _____

52 _____

53 _____

54 _____

55 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock
minutes
Subtract _____ required

4 5,324 × 57 303,468

5 2,442 × 35 85,470

6 3,587 × 46 165,002

7 2,947 × 23 67,781

8 23.5 × 4.06 95.41

9 7,534 × 24 180,816

10 1,375 × 28 38,500

56 MULTIPLICATION—THREE- AND FOUR-DIGIT COMBINATIONS

4. VERIFY YOUR ANSWER, 232,552, and record it in the spaces provided.

Cross Hand Fingering Combinations

Cross hand fingering combinations are used to avoid awkward inverted hand positions.

To do Problems 41-50, follow the steps listed below for solving Problem 41.

1. POSITION FINGERS. Place the tips of the first and second fingers of the right hand on 1 and 3 in rows four and three.

2. CROSS OVER with the left hand to the right side of the keyboard, and place the tips of the second and first fingers on 7 and 5 in rows two and one.

3. MULTIPLY as usual, using the touch method.

4. VERIFY YOUR ANSWER, 78,375, and record it in the spaces provided.

Zeros in Multiplication

To do multiplication problems containing zeros in either the multiplier or the multiplicand observe these rules:

1. When one or more zeros appear in the multiplier, **move one row to the left** for each zero without striking any keys.
2. When one or more zeros appear in the multiplicand, skip the rows in which zeros occur.

COMPLETE THE TIMED DRILL as usual, and use Grading Scale No. 2 on page 187 to determine your grade. Give the completed job to your instructor.

57 SUBTRACTION AND CREDIT BALANCES

JOB NO. 57
SUBTRACTION AND CREDIT BALANCES

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To introduce the use of small key top figures in subtraction.
2. To present the procedure used in obtaining a credit balance.

HIGHLIGHTS

Each key top on a calculator has two figures on it — a **large** one and a **small** one. The large figures are used in adding and multiplying. The small ones are used in subtracting and dividing.

The small figures begin with zero at the **top** of the keyboard and descend in consecutive order to 8 at the bottom. There are no small 9's. In subtracting and dividing, rows in which 9's occur are **skipped**. The small figures are the machine complements of the large figures. Arithmetically, the complement of a number is obtained by subtracting that number from the next highest power of ten. The powers of ten are: 10, 100, 1,000, etc. For machine use, the complement of a number is obtained by depressing small key top figures **less one.**

PROCEDURE

Simplex Calculators — (one set of dials)

1. **CLEAR MACHINE.**
2. **ADD THE MINUEND** (top number), 7.35, using **large figures** and the touch method.
3. **PLACE THE FIRST FINGER** of the right hand on small two (7^2) in row three from the right of the machine, and:
   a. On **Burroughs** manual calculators, with the left hand, depress four 9's to the left of the row which you are holding.

1	2	3	4
7.35 −2.08	5.47 −3.85	6.21 −4.06	4.55 −2.24
5	6	7	8
7.33 −.54	5.44 −2.04	4.26 −2.38	6.35 −.95
9	10	11	12
9.87 −1.02	7.67 −2.86	5.20 −2.09	4.10 −.81
13	14	15	16
9.20 −1.29	5.20 −3.00	8.10 −7.45	6.14 −1.13

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____

JOB NO. 57 / CONTINUED

17	18	19	20
4.52	3.81	6.42	5.92
—2.12	—1.15	—4.52	—2.25
21	22	23	24
6.76	5.98	5.47	9.35
—3.82	—4.07	—4.23	—7.02
25	26	27	28
6.28	4.56	8.55	3.89
—2.47	—3.02	—5.32	—2.06
29	30	31	32
5.94	4.76	9.36	8.46
— .66	—3.12	—5.08	—6.15

ANSWERS

17 _____
18 _____
19 _____
20 _____
21 _____
22 _____
23 _____
24 _____
25 _____
26 _____
27 _____
28 _____
29 _____
30 _____
31 _____
32 _____

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57 SUBTRACTION AND CREDIT BALANCES

b. On all other calculators, hold back the subtraction cut-off key or depress the subtraction control key to the left of the row on which you have placed your finger.

4. **DEPRESS KEYS** for the subtrahend (the bottom number) **less one** as follows:
   a. Depress **small** two (7^2) in row three.
   b. **Look** for and depress **small zero** (9^0) in row two.
   c. Look for and depress small seven (2^7), 8 less one, in row one.
5. **RECORD ANSWER,** 5.27, in the space below the problem, but **do not clear** the dials.
6. **ADD SUBTRAHEND,** 2.08, using **large figures** and the touch method. The dials should show 7.35, the minuend, proving the accuracy of the answer.
7. **RECORD VERIFIED ANSWER** in the Answers column.

Duplex Calculators — (two sets of dials)

1. **ADD THE MINUEND** (the top number), 7.35, using **large figures** and the touch method.
2. **TRANSFER THE MINUEND** to the rear dials by depressing the (+) bar on the **Burroughs** or by pushing the add-subtract lever downward on the **Comptometer**.
3. **DEPRESS THE SUBTRAHEND,** 2.08, (**not less one** and skip row two because large zeros are not depressed) using **large figures** and the touch method.
4. **PUSH THE SUBTRACT (—) BAR** **upward** on the **Burroughs**, or the add-subtract lever **upward** on the **Comptometer**.
5. **ANSWER IS DISPLAYED.** The answer, 5.27, will appear in the rear dials.
6. **DO THE PROBLEM AGAIN,** and record the verified answer in the Answers column.

57 SUBTRACTION AND CREDIT BALANCES

SPECIAL PROBLEMS

To do Problem 5, which has more figures in the top number than in the bottom one, follow these steps:

1. **ADD TOP NUMBER,** 7.33, using large figures and the touch method.
2. **DEPRESS FOUR 9's,** or use the subtraction cut-off or control key, to the left of row three.
3. **DEPRESS SMALL "0"** in row three, to give the bottom number as many figures as the top one.
4. **DEPRESS SMALL 5 AND SMALL 3** (4 less 1) in rows two and one.
5. **RECORD ANSWER,** 6.79, in the space provided below the problem, but do not clear the dials.
6. **ADD SUBTRAHEND,** .54, using large figures and the touch method.
7. **RECORD VERIFIED ANSWER.** If necessary, do the problem again; and record the verified difference in the Answers column.

If the subtrahend ends in a nine, as in Problem 13, depress small 1 in row three; depress small 2 in row two; and small 8 (9 less 1) in row one — the 9 becomes an 8, and must, therefore, be depressed.

If the subtrahend ends in a zero, as in Problem 14, depress small 2 in row 3. Skip rows 2 and 1 because 9's are not depressed — (3.00 less 1 equals 2.99).

CREDIT BALANCES

Simplex Calculators — (one set of dials)

When the subtrahend is larger than the minuend, follow the procedure outlined below for solving Problem 49.

JOB NO. 57 / CONTINUED Name _____ Period _____

33	34	35	36
6.76	5.98	5.47	9.35
—.82	—4.20	—4.29	—7.62
37	**38**	**39**	**40**
6.28	4.56	8.55	3.89
—2.09	—3.22	—5.32	—2.06
41	**42**	**43**	**44**
5.94	4.76	9.36	8.46
—3.66	—3.10	—5.87	—6.15
45	**46**	**47**	**48**
6.38	4.73	4.90	6.75
—5.22	—3.82	—1.24	—4.03

ANSWERS

33 _____
34 _____
35 _____
36 _____
37 _____
38 _____
39 _____
40 _____
41 _____
42 _____
43 _____
44 _____
45 _____
46 _____
47 _____
48 _____

177

JOB NO. 57 / CONTINUED

49

2.75
−5.58

50

1.19
−7.52

51

5.90
−8.40

52

3.43
−5.76

53

2.45
−4.53

54

6.75
−8.61

ANSWERS

49 _____

50 _____

51 _____

52 _____

53 _____

54 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock _____ minutes

Subtract _____ required

TIMED DRILL

1	2	3
.63	.35	5.67
4.25	.27	2.36
3.36	.53	.52
.47	3.38	.48
8.11	4.49	4.80
1.90	1.89	.65
2.58	5.79	3.10
.20	.91	5.63
.74	5.21	1.04
.36	.97	.90
5.15	.33	1.12
6.60	1.40	.83
34.35	25.52	27.10

E= 178

4 87.24 × 86 7,502.64

5 9.716 × 37 359.492

6 12.98 × 52 674.96

7

6.45
−1.92

4.53

8

9.54
−.53

9.01

9

7.86
−1.70

6.16

10

1.68
−4.87

3.19 Cr.

11

3.76
−5.43

1.67 Cr.

12

9.87
−1.02

8.85

57 SUBTRACTION AND CREDIT BALANCES

1. **ADD MINUEND.** 2.75, using the touch method.
2. **DEPRESS FOUR 9's** to the left of row 3 on all simplex machines. **Do not** use the subtraction cut-off or subtraction control keys.
3. **DEPRESS SMALL 5** in row three, small 5 in row two, and small 7 (8 less 1) in row one.
4. **CREDIT BALANCE IS INDICATED.** The answer dials will show 99999997.17. The series of 9's to the left of 7.17 signals a credit balance.
5. **OBTAIN TRUE CREDIT BALANCE:**
   a. Disregard the 9's.
   b. Deduct 1 from 7.17, and depress small 7-1-6. The dials should show zeros and a 1.
   c. Again depress small 7-1-6. The dials now show the true credit balance, 2.83.
6. **DO THE PROBLEM AGAIN,** and record the verified answer in the space provided.

Duplex Calculators — (two sets of dials)

1. **ENTER MINUEND,** 2.75, as usual.
2. **DEPRESS PLUS (+) BAR** or move the add-subtract lever downward.
3. **ENTER SUBTRAHEND,** 5.58, as usual.
4. **MOVE SUBTRACT (—) BAR** or the add-subtract lever upward.
5. **CREDIT BALANCE INDICATED.** The rear dials will show 99999997.17.
6. **OBTAIN TRUE CREDIT BALANCE.** Disregard the 9's. Deduct 1 from 7.17, and depress small 7-1-6.
7. **ANSWER IS DISPLAYED.** The answer, 2.83 Cr., appears in the front dials.

COMPLETE THE TIMED DRILL, and use Grading Scale No. 2 on page 187 to determine your grade. Record your best grade, as usual, and give the completed job to your instructor.

58 DIVISION AND CROSSFOOTING

JOB NO. 58
DIVISION AND
CROSSFOOTING

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIMS:

1. To present the procedure followed to divide on a key-driven calculator.
2. To develop speed and accuracy in cross-footing.

PROCEDURE

To complete the division problems in this job, follow the procedure listed below for solving Problem 1.

1. **ADD THE DIVIDEND,** 1,824, at the extreme **left side** of the keyboard.
2. **PLACE DECIMAL MARKER** at the right of the dividend, 1,824, and then move it one place to the **left** for each whole number in the divisor, 24. The dials will show 018.240000.
3. **PLACE FINGERS** over **small** 2 and 3 (for the divisor, 24, less 1) in the first two rows at the extreme left of the keyboard.
4. **EQUAL THE TRIAL-DIVISOR.**
   a. The figure to the left of the rows you are holding is zero, (0 18.240000). Zero trial-divisors are ignored.
5. **REDUCE THE REMAINDER** which is in the dials directly below the keys you are holding.
   a. The remainder is 18. The dials show (0 (18.) 240000).
   b. Because the remainder, 18, is smaller than the divisor, 24, you do not have to reduce it.
6. **MOVE YOUR FINGERS** one row to the right.

Division Without Remainders

1	1,824 ÷ 24 _____	11	4,332 ÷ 722 _____
2	2,448 ÷ 34 _____	12	3,736 ÷ 467 _____
3	2,144 ÷ 67 _____	13	2,415 ÷ 345 _____
4	8,675 ÷ 25 _____	14	4,887 ÷ 543 _____
5	1,809 ÷ 67 _____	15	5,056 ÷ 632 _____
6	2,128 ÷ 38 _____	16	2,632 ÷ 376 _____
7	2,652 ÷ 34 _____	17	1,015 ÷ 145 _____
8	2,613 ÷ 67 _____	18	4,944 ÷ 824 _____
9	2,028 ÷ 78 _____	19	5,187 ÷ 741 _____
10	1,344 ÷ 28 _____	20	2,436 ÷ 348 _____

Dividing on a Key-Driven Calculator

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____
20 _____

(179)

JOB NO. 58 / CONTINUED

Horizontal Addition — Crossfooting

Use the touch method to add each problem twice.

		ANSWERS
21	8.26 + 4.68 + 5.97 + 1.86 _____ _____	21 _____
22	8.63 + 3.45 + 9.48 + 4.59 _____ _____	22 _____
23	7.28 + 6.39 + 8.61 + 7.18 _____ _____	23 _____
24	9.32 + 2.14 + 7.38 + 4.92 _____ _____	24 _____
25	4.36 + 4.82 + 2.49 + 4.19 _____ _____	25 _____
26	4.86 + 5.97 + 6.17 + 9.05 _____ _____	26 _____
27	2.42 + 5.24 + 1.79 + 1.86 _____ _____	27 _____
28	1.01 + 7.94 + .86 + 5.10 _____ _____	28 _____
29	9.32 + 2.14 + 7.28 + 1.13 _____ _____	29 _____
30	4.39 + 2.13 + .46 + 9.42 _____ _____	30 _____
31	8.35 + 2.69 + 3.72 + 6.40 _____ _____	31 _____
32	9.61 + 7.25 + 2.14 + 8.50 _____ _____	32 _____

= 180

58 DIVISION AND CROSSFOOTING

7. EQUAL the trial-divisor. It is the figure to the left of the rows you are holding. The dials show:

0 (1) 82 40000
TRIAL-DIVISOR ↑ ↑ ROWS BEING USED

a. Count as you depress the keys once.

b. Since the count 1 and the trial-divisor 2, (0 (2) 5840000), are not equal, depress the keys again. Count is two.

c. Since the count 2 and the trial-divisor 3, (0 (3) 3440000), are not equal, depress the keys again. Count is three.

d. Since the count 3 and the trial-divisor 4, (0 (4) 1040000), are not equal, depress the keys again. Count is four.

e. Since the count 4 and the trial-divisor 4, (0 (4) 8640000), are equal, the first step in the division cycle has been completed.

8. REDUCE the remainder, 86.

a. Depress the keys (without counting) until the remainder, 86, is smaller than the divisor, 24. After three depressions, the remainder will become 14 and, because it is smaller than 24, you **move** one row to the right.

9. BEGIN DIVISION CYCLE AGAIN by equaling the trial-divisor, 1, (07 (1) 440000).

a. Depress the keys and count until the count and the trial-divisor are the same.

b. After you have counted to 2, the trial-divisor 2, (07 (2) 960000), will have been equaled, and should be ignored.

58 DIVISION AND CROSSFOOTING

10. REDUCE the remainder, 96.

a. After four depressions, the remainder will become zero, and only the answer, (76) .000000) will remain in the dials.

b. Record 76 in the space provided.

11. MULTIPLY THE ANSWER, 76, by the divisor, 24, to prove the accuracy of the computation. You should get 1,824, the dividend.

a. Record the verified answer in the Answers column at the right.

12. COMPLETE REMAINING PROBLEMS using the above division cycle of **equal, reduce, move.**

CROSSFOOTING

Adding numbers horizontally is called crossfooting. Use the same touch method to do Problems 21-32 that was used for vertical addition.

DIVISION WITH A REMAINDER

Problems 1-20 divided out evenly — without a remainder. In actual practice very few problems work out evenly.

When a division problem does not divide out evenly, carry out the division to three places beyond the decimal point, as follows:

1. USE THE THREE-STEP DIVISION CYCLE of **equal, reduce, move** until you have three places beyond the decimal point.

a. The third place is not complete until the resulting remainder has been reduced.

JOB NO. 58 / CONTINUED Name_____ Period_____

Division With Remainders

33. 253 ÷ 24 _____
34. 407 ÷ 45 _____
35. 353 ÷ 34 _____
36. 578 ÷ 74 _____
37. 523 ÷ 58 _____
38. 557 ÷ 51 _____
39. 631 ÷ 72 _____
40. 779 ÷ 23 _____

ANSWERS

33 _____
34 _____
35 _____
36 _____
37 _____
38 _____
39 _____
40 _____
41 _____
42 _____
43 _____
44 _____

Subtraction Review

41	42	43	44
7.91	8.63	9.65	6.51
−1.45	−6.50	−1.52	−4.05

181

When 9 appears in the subtrahend, do not depress any key in the row in which it occurs.

45	46	47
5.09	9.80	7.62
−3.10	−4.93	−6.00

ANSWERS

45 _____

46 _____

47 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

TIMED DRILL

1	2	3	4	5	6
7.16	.67	9.64	8.06	7.54	8.71
.73	2.31	6.29	−7.92	−2.07	−2.00
.43	2.40	.50			
4.83	7.29	.82	.14	5.47	6.71
.50	8.90	6.86			
.54	4.43	.44			
4.32	.77	.44			
.07	1.45	.76			
.78	4.98	7.35			
1.63	.36	.47			
4.71	8.21	6.09			
6.62	6.83	1.66			
32.32	48.60	41.32			

E 182

Divide:

7 8,675 ÷ 25 347

8 469 ÷ 67 7

9 448 ÷ 56 8

10 238 ÷ 34 7

58 DIVISION AND CROSSFOOTING

2. VERIFY ANSWER. To prove the accuracy of the answer, multiply it by the divisor, and add in the remainder.

a. For Problem 33, after the remainder following the third figure beyond the decimal has been reduced, the dials will show: (010.541 (06) 0).

b. Multiply 10.541 by 24 to get 252.984. Add in the remainder, 16, to get the dividend, 253.

c. Record in the verified answer as 10.54, in the spaces provided.

After all problems have been completed:

1. COMPLETE THE TIMED DRILL as usual, and use Grading Scale No. 4 on page 187 to determine your grade.

a. If you have time, do the Timed Drill again.

b. Record your best grade on the Achievement Chart on page 188.

2. GIVE JOB TO INSTRUCTOR when completed.

59 FIXED DECIMAL MULTIPLICATION

JOB NO. 59
FIXED DECIMAL MULTIPLICATION

Name _____ No. of Errors _____

Period _____ Date _____ Rating _____

AIM:

To show the use of accumulative multiplication, over a fixed decimal point, to verify the computations of an invoice.

HIGHLIGHTS

The verification of invoices payable is best accomplished by accumulative multiplication over a fixed decimal point. The fixed decimal point is most often placed between the fifth and sixth dials (fourth and third on small calculators).

The operator holds one factor over the fixed decimal (usually the price) and moves one place to the left for every whole number **less one** (in the quantity) **before** he depresses the keys for the first figure at the **left** of the multiplier. He then moves one place to the right and continues to multiply from **left to right** for the remaining figures of the multiplier.

As he continues to accumulate the products of the factors listed in the problem, the machine automatically lists whole numbers and decimals in their proper rows.

PROCEDURE

To complete Problems 1-10 of this job, follow the steps listed below for solving Problem 1.

1. **CLEAR MACHINE.**
2. **PLACE DECIMAL MARKER** between dials six and five on an eight-row machine, or between dials four and three on smaller calculators.

1

36 Items @ $2.45
45 " @ .93
24 " @ 1.35
34 " @ 2.98

2

23 Items @ $3.46
45 " @ 5.67
26 " @ .89
34 " @ 6.50

3

4 Items @ $3.35
25 " @ 3.24
36 " @ .95
28 " @ 4.55

4

35 Items @ $4.68
34 " @ .58
4 " @ 3.00
24 " @ 4.05

5

6 Items @ $ 4.87
3 " @ 24.56
42 " @ .89
36 " @ 1.145

6

22 Items @ $6.81
33 " @ .56
45 " @ .785
55 " @ 8.35

7

87 Items @ $4.50
67 " @ 2.07
39 " @ .58
67 " @ 2.15

8

47 Items @ $ .89
92 " @ 1.19
32 " @ .975
47 " @ .625

ANSWERS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

183

JOB NO. 59 / CONTINUED

9

41 Items @ $ .92
91 " " 1.02
8 " " .95
47 " " 1.05

10

86 Items @ $4.50
72 " " .62
92 " " 1.72
49 " " 2.50

ANSWERS

9 _____

10 _____

TIMED DRILL

Finished at _____ o'clock

Started at _____ o'clock

Subtract _____ minutes required

1

5.11
4.53
2.94
.10
4.10
.29
.67
.11
.96
.47
3.99
.90

24.17

2

4.38
.31
2.78
6.30
1.25
5.33
6.63
.41
4.84
3.80
.15
2.76

38.94

3

5.38
.72
4.93
.91
6.24
.53
.54
.20
.41
.19
5.95
5.65

31.65

4

1.29
.90
2.82
.20
.21
.62
8.51
.84
8.12
5.19
.92
.96

30.58

5

35 Items @ $4.78
45 " " 5.22
43 " " 2.95
24 " " 9.53

757.77

6

5 Items @ $45.06
25 " " 5.78
6 " " .567
34 " " 2.39

454.46

7

5.32
−2.07

3.25

8

6.07
−3.42

2.65

9

5.45
−1.64

3.81

10

6.35
−1.06

5.29

11 2,148 × 43 92,364

12 758.6 × 2.5 1,896.50

184

59 FIXED DECIMAL MULTIPLICATION

3. POSITION FINGERS. Place (do not depress) the first finger of the left hand over 2 in row six (the whole number or dollars row), and the first and second fingers of the right hand over 4 and 5 in rows five and four (the decimal or cents rows).

4. MOVE ONE ROW TO THE LEFT for every whole number in the quantity **less one**. Since 36, the quantity, has two whole numbers, move one row to the left, and multiply by 3 (the left figure of 36). The dials will show 73.50. **Do not** clear the dials.

5. MOVE ONE ROW TO THE RIGHT, and multiply by 6. The dials will show 88.20.

6. MULTIPLY the three remaining pairs of factors in the same way.

a. Place your fingers on .93, move one row to the left, and multiply by 4 and then by 5. The dials should show 130.05.

b. Place your fingers on 1.35, move one row to the left, and multiply by 2 and then by 4. The dials should show 162.45.

c. Place your fingers on 2.98, move one row to the left, and multiply by 3 and then by 4. The dials should show the accumulated answer 263.77.

d. Record the answer in the space provided, and immediately do the problem again.

e. Record the verified answer in the Answers column at the right.

COMPLETE THE TIMED DRILL, as usual, and use Grading Scale No. 3 to determine your grade. Give the completed job to your instructor.

60 REVIEW

TOUCH-OPERATED, KEY-DRIVEN CALCULATOR

JOB NO. 60
REVIEW

Name _____
Period _____ Date _____
No. of Errors _____ Rating _____

Time Completed _____
Time Started _____
Minutes Required _____

AIMS:

1. To review the operating principles presented in Job Nos. 51 through 59.
2. To determine the proficiency acquired in the operation of key-driven calculators.

PROCEDURE

1. **CLEAR MACHINE,** and do each problem only once.
2. **RECORD ANSWERS** directly below or beside each problem and in the Answers column at the right.
3. **RECORD TIME** the job was started, the time it was completed, and the number of minutes required to complete the job in the spaces provided. In recording the time, drop fractions of a minute smaller than ½. Fractions larger than ½ minute but less than one full minute are recorded as ½ minute. Subtract to get the time required for completion of the job.
4. **DO JOB AGAIN,** if you have the time. Try to improve your speed.
5. **WRITE YOUR NAME** and other information required in the spaces provided at the upper center of the job sheet.
6. **GIVE JOB TO INSTRUCTOR** when completed.

NOTE: Before proceeding to the next job, ask your instructor about Test No. 12. Test Nos. 11 and 12 should be completed before you start another job.

1

.34
.58
.61
.27
.93
.69
.80
.14
.47
.30
.25
.73

2

.45
.31
1.26
3.70
.49
8.62
.50
6.42
.31
.28
4.93
.40

3

2.13
.72
.45
9.30
.68
7.20
.14
8.53
3.42
.37
.39
.20

4

4.72
1.12
3.64
9.70
8.43
2.02
6.34
4.87
5.98
3.03
6.32
7.67

5

63.87
66.12
48.67
21.41
36.42
47.45
36.32
45.10
37.29
63.58
59.68
47.12

6

7 Items @ $ 5.45
23 " " 35.82
34 " " .85
56 " " 2.145

7

44 Items @ $7.94
35 " " .75
43 " " .90
57 " " 9.45

8

7.23
−2.96

9

3.41
−1.09

10

4.78
−.92

11

6.55
−9.43

12

7.68
−1.34

ANSWERS

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____

JOB NO. 60 / CONTINUED

13	14	15	16	17
7.08	2.09	4.37	7.68	44.79
4.46	2.43	7.98	2.04	37.37
4.17	8.47	7.65	1.71	21.88
6.26	4.60	7.72	2.32	32.01
4.15	6.30	9.29	4.20	36.90
2.53	4.51	7.15	5.17	24.59
4.20	4.79	6.88	5.16	48.36
6.87	6.40	6.40	1.00	55.79
3.28	8.61	2.46	9.92	45.58
5.49	9.07	3.08	3.74	12.55
9.41	6.92	3.05	1.30	34.19
7.92	4.25	8.35	9.59	34.28

18 832 ÷ 26 _____

19 3,815 ÷ 545 _____

20 748 ÷ 34 _____

21 5,056 ÷ 632 _____

22 16.24 × 9.2 _____

23 4.628 × 43 _____

24 835 × 414 _____

25 467 × 542 _____

26 1.56 + 2.35 + 1.37 + 1.48 + 9.36 _____

27 2.33 + 4.22 + 5.33 + 2.59 + 8.42 _____

28 4.88 + 1.67 + 3.67 + 3.67 + 1.22 _____

29 5.44 + 3.35 + 9.55 + 2.12 + 5.45 _____

30 6.33 + 6.33 + 8.44 + 3.13 + 6.36 _____

ANSWERS

13 _____

14 _____

15 _____

16 _____

17 _____

18 _____

19 _____

20 _____

21 _____

22 _____

23 _____

24 _____

25 _____

26 _____

27 _____

28 _____

29 _____

30 _____

60 REVIEW

ON THE JOB

Accuracy is important.

Seemingly unimportant errors have cost jobs and caused bankruptcy.

TIMED DRILL INSTRUCTIONS

1. In the spaces provided at the upper right of the drill, record the starting and finishing time. Drop fractions of a minute smaller than a half; record as ½ any fraction bigger than a half a minute.
2. Do each problem only **once**.
3. Place a check mark (✓) next to the answer if your answer is correct, an (X) if incorrect.
4. Count the (X's), and use the Grading Scale indicated in the job to determine your grade.
5. If you finish the timed drill in less time than is listed at the top of the Grading Scale, you are awarded an extra plus (+). This raises your mark to A+, A, B+, or B depending on the number of errors you made.
6. If you have time, do the Timed Drill again. Try to improve your speed and accuracy.
7. Record your best grade on the Achievement Chart on page 188.

GRADING SCALES FOR TIMED DRILLS

GRADING SCALE NO. 1

Time Required	Errors 0	1	2	3 or more
4 minutes*	A	B+	B	C+
4½ minutes	B+	B	C+	C
5 minutes	B	C+	C	D+
5½ minutes	C+	C	D+	D
6 minutes	C	D+	D	F
6½ minutes	D+	D	F	F
7 minutes — up Repeat				

GRADING SCALE NO. 2

Time Required	Errors 0	1	2	3 or more
5 minutes*	A	B+	B	C+
5½ minutes	B+	B	C+	C
6 minutes	B	C+	C	D+
6½ minutes	C+	C	D+	D
7 minutes	C	D+	D	F
7½ minutes	D+	D	F	F
8 minutes — up Repeat				

GRADING SCALE NO. 3

Time Required	Errors 0	1	2	3 or more
6 minutes*	A	B+	B	C+
6½ minutes	B+	B	C+	C
7 minutes	B	C+	C	D+
7½ minutes	C+	C	D+	D
8 minutes	C	D+	D	F
8½ minutes	D+	D	F	F
9 minutes — up Repeat				

GRADING SCALE NO. 4

Time Required	Errors 0	1	2	3 or more
7 minutes*	A	B+	B	C+
7½ minutes	B+	B	C+	C
8 minutes	B	C+	C	D+
8½ minutes	C+	C	D+	D
9 minutes	C	D+	D	F
9½ minutes	D+	D	F	F
10 minutes — up Repeat				

*A bonus of an extra plus (+) is awarded, if you finished in less time than is listed at the top of the scale.

ACHIEVEMENT CHART FOR TIMED DRILLS

TEN-KEY ADDING AND LISTING

Job No.	Date	Grade	Average
2			
3			
4			
5			
6			
7			
8			
9			

TEN-KEY ELECTRONIC CALCULATOR

Job No.	Date	Grade	Average
22			
23			
24			
25			
26			
27			
28			
29			

ROTARY CALCULATOR

Job No.	Date	Grade	Average
41			
42			
43			
44			
45			
46			
47			
48			
49			

TEN-KEY PRINTING CALCULATOR

Job No.	Date	Grade	Average
11			
12			
13			
14			
15			
16			
17			
18			
19			

FULL-KEYBOARD ADDING LISTING

Job No.	Date	Grade	Average
32			
33			
34			
35			
36			
37			
38			
39			

KEY-DRIVEN CALCULATOR

Job No.	Date	Grade	Average
51			
52			
53			
54			
55			
56			
57			
58			
59			

TABLE OF RECIPROCALS

			100		200		300		400	
		50 2000 000	100 1000 000	150 6666 667	200 5000 000	250 4000 000	300 3333 333	350 2857 143	400 2500 000	450 2222 222
1	1000 000	51 1960 784	1 9900 990	51 6622 517	1 4975 124	51 3984 064	1 3322 259	51 2849 003	1 2493 766	51 2217 295
2	5000 000	52 1923 077	2 9803 922	52 6578 947	2 4950 495	52 3968 254	2 3311 258	52 2840 909	2 2487 562	52 2212 389
3	3333 333	53 1886 792	3 9708 738	53 6535 948	3 4926 108	53 3952 569	3 3300 330	53 2832 861	3 2481 390	53 2207 506
4	2500 000	54 1851 852	4 9615 385	54 6493 506	4 4901 961	54 3937 008	4 3289 474	54 2824 859	4 2475 248	54 2202 643
5	2000 000	55 1818 182	5 9523 810	55 6451 613	5 4878 049	55 3921 569	5 3278 689	55 2816 901	5 2469 136	55 2197 802
6	1666 667	56 1785 714	6 9433 962	56 6410 256	6 4854 369	56 3906 250	6 3267 974	56 2808 989	6 2463 054	56 2192 982
7	1428 571	57 1754 386	7 9345 794	57 6369 427	7 4830 918	57 3891 051	7 3257 329	57 2801 120	7 2457 002	57 2188 184
8	1250 000	58 1724 138	8 9259 259	58 6329 114	8 4807 692	58 3875 969	8 3246 753	58 2793 296	8 2450 980	58 2183 406
9	1111 111	59 1694 915	9 9174 312	59 6289 308	9 4784 689	59 3861 004	9 3236 246	59 2785 515	9 2444 988	59 2178 649
10	1000 000	60 1666 667	110 9090 909	160 6250 000	210 4761 905	260 3846 154	310 3225 806	360 2777 778	410 2439 024	460 2173 913
11	9090 909	61 1639 344	11 9009 009	61 6211 180	11 4739 336	61 3831 418	11 3215 434	61 2770 083	11 2433 090	61 2169 197
12	8333 333	62 1612 903	12 8928 571	62 6172 840	12 4716 981	62 3816 794	12 3205 128	62 2762 431	12 2427 184	62 2164 502
13	7692 308	63 1587 302	13 8849 558	63 6134 969	13 4694 836	63 3802 281	13 3194 888	63 2754 821	13 2421 308	63 2159 827
14	7142 857	64 1562 500	14 8771 930	64 6097 561	14 4672 897	64 3787 879	14 3184 713	64 2747 253	14 2415 459	64 2155 172
15	6666 667	65 1538 462	15 8695 652	65 6060 606	15 4651 163	65 3773 585	15 3174 603	65 2739 726	15 2409 639	65 2150 538
16	6250 000	66 1515 152	16 8620 690	66 6024 096	16 4629 630	66 3759 398	16 3164 557	66 2732 240	16 2403 846	66 2145 923
17	5882 353	67 1492 537	17 8547 009	67 5988 024	17 4608 295	67 3745 318	17 3154 574	67 2724 796	17 2398 082	67 2141 328
18	5555 556	68 1470 588	18 8474 577	68 5952 381	18 4587 156	68 3731 343	18 3144 654	68 2717 391	18 2392 344	68 2136 752
19	5263 158	69 1449 275	19 8403 361	69 5917 160	19 4566 210	69 3717 472	19 3134 796	69 2710 027	19 2386 635	69 2132 196
20	5000 000	70 1428 571	120 8333 333	170 5882 353	220 4545 455	270 3703 704	320 3125 000	370 2702 703	420 2380 952	470 2127 660
21	4761 905	71 1408 451	21 8264 463	71 5847 953	21 4524 887	71 3690 037	21 3115 265	71 2695 418	21 2375 297	71 2123 142
22	4545 455	72 1388 889	22 8196 721	72 5813 953	22 4504 505	72 3676 471	22 3105 590	72 2688 172	22 2369 668	72 2118 644
23	4347 826	73 1369 863	23 8130 081	73 5780 347	23 4484 305	73 3663 004	23 3095 975	73 2680 965	23 2364 066	73 2114 165
24	4166 667	74 1351 351	24 8064 516	74 5747 126	24 4464 286	74 3649 635	24 3086 420	74 2673 797	24 2358 491	74 2109 705
25	4000 000	75 1333 333	25 8000 000	75 5714 286	25 4444 444	75 3636 364	25 3076 923	75 2666 667	25 2352 941	75 2105 263
26	3846 154	76 1315 789	26 7936 508	76 5681 818	26 4424 779	76 3623 188	26 3067 485	76 2659 574	26 2347 418	76 2100 840
27	3703 704	77 1298 701	27 7874 016	77 5649 718	27 4405 286	77 3610 108	27 3058 104	77 2652 520	27 2341 920	77 2096 436
28	3571 429	78 1282 051	28 7812 500	78 5617 978	28 4385 965	78 3597 122	28 3048 780	78 2645 503	28 2336 449	78 2092 050
29	3448 276	79 1265 823	29 7751 938	79 5586 592	29 4366 812	79 3584 229	29 3039 514	79 2638 522	29 2331 002	79 2087 683
30	3333 333	80 1250 000	130 7692 308	180 5555 556	230 4347 826	280 3571 429	330 3030 303	380 2631 579	430 2325 581	480 2083 333
31	3225 806	81 1234 568	31 7633 588	81 5524 862	31 4329 004	81 3558 719	31 3021 148	81 2624 672	31 2320 186	81 2079 002
32	3125 000	82 1219 512	32 7575 758	82 5494 505	32 4310 345	82 3546 099	32 3012 048	82 2617 801	32 2314 815	82 2074 689
33	3030 303	83 1204 819	33 7518 797	83 5464 481	33 4291 845	83 3533 569	33 3003 003	83 2610 966	33 2309 469	83 2070 393
34	2941 176	84 1190 476	34 7462 687	84 5434 783	34 4273 504	84 3521 127	34 2994 012	84 2604 167	34 2304 147	84 2066 116
35	2857 143	85 1176 471	35 7407 407	85 5405 405	35 4255 319	85 3508 772	35 2985 075	85 2597 403	35 2298 851	85 2061 856
36	2777 778	86 1162 791	36 7352 941	86 5376 344	36 4237 288	86 3496 503	36 2976 190	86 2590 674	36 2293 578	86 2057 613
37	2702 703	87 1149 425	37 7299 270	87 5347 594	37 4219 409	87 3484 321	37 2967 359	87 2583 979	37 2288 330	87 2053 388
38	2631 579	88 1136 364	38 7246 377	88 5319 149	38 4201 681	88 3472 222	38 2958 580	88 2577 320	38 2283 105	88 2049 180
39	2564 103	89 1123 596	39 7194 245	89 5291 005	39 4184 100	89 3460 208	39 2949 853	89 2570 694	39 2277 904	89 2044 990
40	2500 000	90 1111 111	140 7142 857	190 5263 158	240 4166 667	290 3448 276	340 2941 176	390 2564 103	440 2272 727	490 2040 816
41	2439 024	91 1098 901	41 7092 199	91 5235 602	41 4149 378	91 3436 426	41 2932 551	91 2557 545	41 2267 574	91 2036 660
42	2380 952	92 1086 957	42 7042 254	92 5208 333	42 4132 231	92 3424 658	42 2923 977	92 2551 020	42 2262 443	92 2032 520
43	2325 581	93 1075 269	43 6993 007	93 5181 347	43 4115 226	93 3412 969	43 2915 452	93 2544 529	43 2257 336	93 2028 398
44	2272 727	94 1063 830	44 6944 444	94 5154 639	44 4098 361	94 3401 361	44 2906 977	94 2538 071	44 2252 252	94 2024 291
45	2222 222	95 1052 632	45 6896 552	95 5128 205	45 4081 633	95 3389 831	45 2898 551	95 2531 646	45 2247 191	95 2020 202
46	2173 913	96 1041 667	46 6849 315	96 5102 041	46 4065 041	96 3378 378	46 2890 173	96 2525 253	46 2242 152	96 2016 129
47	2127 660	97 1030 928	47 6802 721	97 5076 142	47 4048 583	97 3367 003	47 2881 844	97 2518 892	47 2237 136	97 2012 072
48	2083 333	98 1020 408	48 6756 757	98 5050 505	48 4032 258	98 3355 705	48 2873 563	98 2512 563	48 2232 143	98 2008 032
49	2040 816	99 1010 101	49 6711 409	99 5025 126	49 4016 064	99 3344 482	49 2865 330	99 2506 266	49 2227 171	99 2004 008

How to use this table

For figuring such amounts as percentages, costs, and distributions *by multiplying* by the reciprocal of the divisor, prefix the reciprocals found on this table with as many zeros as there are whole-number digits in the divisor, less 1. The reciprocal of 8 is written .125; the reciprocal of 25 is written .04; and the reciprocal of 125 is written .008.

Decimal Equivalents of Common Fractions

3rds	4ths	6ths	8ths	12ths	16ths	32nds	Dec. Eq.
						1/32	.031 25
					1/16	2/32	.062 5
				1/12			.083 33
						3/32	.093 75
			1/8		2/16	4/32	.125
						5/32	.156 25
		1/6		2/12			.166 67
					3/16	6/32	.187 5
						7/32	.218 75
	1/4		2/8	3/12	4/16	8/32	.25
						9/32	.281 25
					5/16	10/32	.312 5
1/3		2/6		4/12			.333 33
						11/32	.343 75
			3/8		6/16	12/32	.375
						13/32	.406 25
				5/12			.416 67
					7/16	14/32	.437 5
						15/32	.468 75
	2/4	3/6	4/8	6/12	8/16	16/32	.5
						17/32	.531 25
					9/16	18/32	.562 5
				7/12			.583 33
						19/32	.593 75
			5/8		10/16	20/32	.625
						21/32	.656 25
2/3		4/6		8/12			.666 67
					11/16	22/32	.687 5
						23/32	718 75
	3/4		6/8	9/12	12/16	24/32	.75
						25/32	.781 25
					13/16	26/32	.812 5
		5/6		10/12			.833 33
						27/32	.843 75
			7/8		14/16	28/32	.875
						29/32	.906 25
				11/12			.916 67
					15/16	30/32	.937 5
						31/32	.968 75

64ths	
1	.015625
2	.031250
3	.046875
4	.062500
5	.078125
6	.093750
7	.109375
8	.125000
9	.140625
10	.156250
11	.171875
12	.187500
13	.203125
14	.218750
15	.234375
16	.250000
17	.265625
18	.281250
19	.296875
20	.312500
21	.328125
22	.343750
23	.359375
24	.375000
25	.390625
26	.406250
27	.421875
28	.437500
29	.453125
30	.468750
31	.484375
32	.500000
33	.515625
34	.531250
35	.546875
36	.562500
37	.578125
38	.593750
39	.609375
40	.625000
41	.640625
42	.656250
43	.671875
44	.687500
45	.703125
46	.718750
47	.734375
48	.750000
49	.765625
50	.781250
51	.796875
52	.812500
53	.828125
54	.843750
55	.859375
56	.875000
57	.890625
58	.906250
59	.921875
60	.937500
61	.953125
62	.968750
63	.984375

All tables printed here and in the student's textbook are also available (in reasonable amounts, please) on individual cards from Victor Comptometer Corporation, Educational Dept., 3900 North Rockwell St., Chicago, Illinois 60618.